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THE BRYOLOGIST

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A SECOND CHECKLIST OF THE LICHENS OF THE CONTINENTAL UNITED STATES AND CANADA*

MASON E. HALE, JR.[1] and WILLIAM L. CULBERSON[2]

Recent progress in North America lichenology has been so rapid that our first checklist of the lichens of the United States, Canada and Alaska (Castanea 21: 73-105. 1956) has become obsolete in less than five years. The unexpectedly wide use given the first list has prompted us to prepare a revised one incorporating new discoveries and modifications and corrections of nomenclature.

Our first list, as was fully expected, omitted a number of records and contained some incorrect or incomplete author citations. We have corrected many of these previously unverified citations and brought them into conformity with the International Code of Botanical Nomenclature. We have also revised and standardized the spelling and abbreviations of authors' names as recommended by the Code.

A few species lack sufficient synonymy for direct placement in the genera recognized here. For such species the basionym or otherwise best-known name is put in brackets within the genus to which, in our estimation, the species probably belongs. No new combinations are made, however, to avoid encumbering the nomenclature with possibly superfluous names.

The list of synonyms and other non-current epithets commonly associated with North American lichens and used in the older American literature has been greatly expanded. Its apparent usefulness to curators in renovating and rearranging their collections

* Copies of this checklist are available from Dr. Lewis E. Anderson, Dept. of Botany, Duke University, Durham, N. C. at a price of $1.00.

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and to students attempting to interpret the American literature was sufficient to justify so increasing its coverage.

We wish to thank all our colleagues who have helped us in revising this list, especially Dr. I. Mackenzie Lamb and Dr. J. W. Thomson, who have given us access to their most recent, unpublished interpretations in *Stereocaulon* and *Physica*, respectively. We are also indebted to Dr. Ove Almborn and Dr. A. W. Herre for lists of corrections.

We now record 2492 species distributed among 196 genera in the lichen flora of the continental United States and Canada.

Acarospora Mass.

veruginosa Hasse
albida Magn.
amabilis Magn.
americana Magn.
amphibola Wedd.
applanata Magn.
arenacea Magn.
arenosa Herre
asperata Magn.
badiofusca (Nyl.) Th. Fr.
bella (Nyl.) Jatta
boulderensis Magn.
bullata Anzi
caesiofusca (Müll. Arg.) Magn.
californica Zahlbr.
canadensis Magn.
carnegiei Zahlbr.
chlorophana (Wahlb.) Mass.
chrysops (Tuck.) Magn.
cinereoalba (Fink) Magn.
citrina (Tayl.) Zahlbr.
coloradiana Magn.
contigua Magn.
desolata Magn.
dispersa Magn.
dissipata Magn.
elevata Magn.
epilutescens Zahlbr.
erythrophora Magn.
evoluta Magn.
fuscata (Nyl.) Arn.
fuscescens Magn.
gallica Magn.
geogena Magn.
glaucocarpa (Wahlb.) Körber
hassei Herre
heppii (Naeg.) Körber
heufleriana Körber
hilaris (Duf.) Hue
immersa Fink
impressula Th. Fr.
incertula Magn.
instrata Magn.
intercedens Magn.
interjecta Magn.
interposita Magn.
interspersa Magn.
lapponica (Ach.) Th. Fr.
macrospora (Hepp) Bagl.
molybdina (Wahlb.) Trev.
montana Magn.
nevadensis Magn.
nigromarginata B. de Lesd.
novomexicana Magn.
obnubila Magn.
obscura Magn.
obpallens (Nyl.) Zahlbr.
occllata Magn.
oligospora (Hepp) Arn.
oxytona (Ach.) Mass.
particularis Magn.
peltastica Zahlbr.
radicata Magn.
reagens Zahlbr.
rimulosa Magn.
rubicunda Magn.
rufescens (Sm.) Th. Fr.
scabrida (Hedl.) Magn.
schleicheri (Ach.) Mass.
scotica Hue
sinopica (Wahlb.) Körber
smaragdula (Wahlb.) Th. Fr.
socialis Magn.
sparsa Magn.
strigata (Nyl.) Jatta
subalbida Magn.
subcontigua Magn.

succedens Magn.
superfusa Magn.
tenebrica Magn.
terricola Magn.
texana Magn.
thamnina (Tuck.) Herre
thelococcoides (Nyl.) Zahlbr.
thermophila Herre
tusconensis Magn.
utahensis Magn.
variegata Magn.
veronensis Mass.
washingtonensis Magn.
weldensis Magn.
xanthophana (Nyl.) Jatta

Actinogyra Scholander

muhlenbergii (Ach.) Scholander
polyrrhiza (L.) Scholander

Agyrophora (Nyl.) Nyl.

leiocarpa (DC.) Gyel.
lyngei (Scholander) Llano
rigida (Du Rietz) Llano
scholanderi Llano

Alectoria Ach.

bicolor (Ehrh.) Nyl.
catharinae Räs.
fremontii Tuck.
implexa (Hoffm.) Nyl.
irvingii Llano
jubata (L.) Ach.
laeta (Tayl.) Linds.
lanea (Ehrh.) Vain.
lanestris (Ach.) Gyel.
minuscula Nyl.
nadvornikiana Gyel.
nidulifera Norrl.
nigricans (Ach.) Nyl.
ochroleuca (Ehrh.) Nyl.
oregana Tuck.
pubescens (L.) Howe
sarmentosa Ach.
simplicior (Vain.) Lynge
subdivergens Dahl
tortuosa Merr.
vexillifera (Nyl.) Stizenb.

Anaptychia Körber

ciliaris (L.) Körber
coralliphora (Tayl.) Lynge
erinacea (Ach.) Trev.
galactophylla (Tuck.) Trev.
granulifera (Ach.) Mass.
heterochroa Vain.
hypoleuca (Mühl.) Vain.
leucomelaena (L.) Vain.
major (Nyl.) Fink
palmatula (Michx.) Vain.
ravenelii (Tuck.) Zahlbr.
sorediifera (Müll. Arg.) Du Rietz & Lynge
speciosa (Wulf.) Mass.
squamulosa Degelius
wrightii (Tuck.) Zahlbr.

Anema Nyl.

dodgei Herre
jeniseiensis Magn.

Anthracothecium Hampe

fibricolum (Fée) Müll. Arg.
muscosum (Vain.) Zahlbr.
ochraceoflavum (Nyl.) Müll. Arg.
pauciloculare Herre
pyrenuloides (Mont.) Müll. Arg.
staurosporum (Tuck.) Zahlbr.
thelomorphum (Tuck.) Zahlbr.

Anzia Stizenb.

colpodes (Ach.) Stizenb.

Arctomia Th. Fr.

delicatula Th. Fr.

Arthonia Ach.

abietina Willey
albofuscescens Tuck.
albovirescens Nyl.
aleuromela Nyl.
astericus Müll. Arg.
atractospora Zahlbr.
atrata (Fée) Müll. Arg.
biseptata Degelius
byssacea (Weig.) Ach.
caesia (Flot.) Körber
caribaea (Ach.) Mass.
carneorufa Willey
caudata Willey
chiodectella Nyl.
cinereopruinosa Schaer.
cinnabarina (DC.) Wallr.
complanata Fée
conferta (Fée) Nyl.

convexella Nyl.
cupressina Tuck.
cytisi Mass.
diffusa Nyl.
diffusella Fink
dispersa (Schrad.) Nyl.
dispersula Nyl.
eckfeldtii Müll. Arg.
epipastoides Nyl.
erubescens Willey
erupta Nyl.
excedens Nyl.
exilis (Flörke) Anzi
fissurinea Nyl.
floridana Willey
galactitella Nyl.
glaucescens Nyl.
glebosa Tuck.
gyalectoides Müll. Arg.
hamamelidis Nyl.
impallens Nyl.
impolita (Ehrh.) Borr.
incarnata (Th. Fr.) Kullh.
lapidicola (Tayl.) Branth & Rostr.
lecanactidea Zahlbr.
lecideella Nyl.
leucastraea Tuck.
lurida Ach.
luridoalba Nyl.
melaspora Tuck.
microspermella Willey
neonii B. de Lesd.
ochrocincta Willey
ochrodiscodes Nyl.
ochrolutea Nyl.
patellulata Nyl.
perminuta Willey
phaeobaea Norm.
pinastri Anzi
platygraphidea Nyl.
platyspilea Nyl.
polygramma Nyl.
polymorpha Ach.
pruinosella Nyl.
pruinosula Nyl.
punctiformis Ach.
pyrrhula Nyl.
pyrrhuliza Nyl.
quintaria Nyl.
radiata (Pers.) Ach.
ravenelii Tuck.
reniformis (Pers.) Ach.
rhoidis Zahlbr.
rubella (Fée) Nyl..
rupicola Fink
siderea Degelius
stictella Stizenb.
subastroidella Nyl.
subdiffusa Willey
subdispuncta Nyl.
subminutissima Nyl.
subminutula Nyl.
subrubella Nyl.
taedescens Nyl.
terrigena Nyl.
tetramera (Stizenb.) Hasse
tortulosa Fée
tuckermaniana Willey
varia (Ach.) Nyl.
vernans Willey
viridicans Willey
willeyi Tuck.
xylographica Nyl.

Arthopyrenia Mass.

ambigua Zahlbr.
analepta (Ach.) Mass.
analeptella (Nyl.) Arn.
bifera Zahlbr.
biformis (Borr.) Mass.
cerasi (Schrad.) Mass.
cinchonae (Ach.) Müll. Arg.
cinereopruinosa (Schaer.) Körber
conformis (Nyl.) Müll. Arg.
conoidea (Fr.) Zahlbr.
dimidiata Fink
distans (Willey) Zahlbr.
epidermidis (DC.) Mass.
fallax (Nyl.) Arn.
finkii Zahlbr.
gemmata (Ach.) Mass.
halodytes (Nyl.) Arn.
hyalospora (Nyl.) Fink
leucochlora Müll. Arg.
macrocarpa (Körber) Zahlbr.
parvula Zahlbr.
pinicola (Hepp) Mass.
prospersella (Nyl.) Zahlbr.
punctiformis (Schrank.) Mass.
quinqueseptata (Nyl.) Fink
rappii Zahlbr.
rhyponta (Ach.) Mass.
sanfordensis Zahlbr.
sphaeroides (Wallr.) Zahlbr.
sublitoralis (Leight.) Arn.

subprostans (Nyl.) Müll. Arg.
subpunctiformis Nyl.

Arthothelium Mass.

abnorme (Ach.) Müll. Arg.
albovirescens (Nyl.) Fink
anastomosans (Ach.) Arn.
distendens (Nyl.) Müll. Arg.
gregarium (Willey) Zahlbr.
hallii (Tuck.) Zahlbr.
interveniens (Nyl.) Zahlbr.
macrothecum (Fée) Mass.
orbilliferum (Almq.) Hasse
pruinascens Zahlbr.
sanguineum (Willey) Zahlbr.
spectabile (Flot.) Mass.
subcyrtodes (Willey) Hasse
taediosum (Nyl.) Müll. Arg.
violascens (Nyl.) Zahlbr.

Bacidia De Not.

abductans (Nyl.) Zahlbr.
acclinis (Mass.) Zahlbr.
akompsa (Tuck.) Fink
alaskensis (Nyl.) Zahlbr.
albescens (Hepp) Zwack
alpina (Schaer.) Vain.
arceutina (Ach.) Rehm.
[*Bilimbia artyta* (Ach.) Fink]
atrogrisea (Del.) Körber
augustini (Tuck.) Zahlbr.
bacillifera (Nyl.) Fink
beckhausii Körber
brouardii (B. de Lesd.) Zahlbr.
caloosensis (Tuck.) Zahlbr.
chlorantha (Tuck.) Fink
chlorococca (Graewe) Lett.
chlorosticta (Tuck.) Schneid.
clemantis Hasse
cupreorosella (Nyl.) Schneid.
declinis (Tuck.) Zahlbr.
dryina (Ach.) Fink
effusa (Sm.) Trev.
egenuloidea Fink
endocyanea (Tuck.) Zahlbr.
flavens (Tuck.) Zahlbr.
flavovirescens (Dicks.) Anzi
floridana (Tuck.) Zahlbr.
fusca (Mass.) Du Rietz
fuscorubella (Hoffm.) Bausch.
granosa (Tuck.) Zahlbr.
gyalectiformis Zahlbr.
gyalizella (Nyl.) Zahlbr.
herrei Zahlbr.
hypnophila (Ach.) Zahlbr.
idahoensis Magn.
incompta (Borr.) Anzi
inundata (Fr.) Körber
ioessa Herre
jacobi (Tuck.) Hasse
kingmanii Hasse
leucophyllina (Nyl.) Fink
lignaria (Ach.) Lett.
luteola (Schrad.) Mudd
meadii (Tuck.) Zahlbr.
melaena (Nyl.) Zahlbr.
microcarpa (Th. Fr.) Lett.
microphyllina (Tuck.) Riddle
molybditis (Tuck.) Zahlbr.
muscorum (Sw.) Mudd
naegelii (Hepp) Zahlbr.
pammellii (Fink) Zahlbr.
ravenelii (Tuck.) Zahlbr.
rosella (Pers.) De Not.
rubidofusca (Willey) Zahlbr.
rubricosa (Müll. Arg.) Zahlbr.
sabuletorum (Flörke) Lett.
schweinitzii (Tuck.) Schneid.
sphaeroides (Dicks.) Zahlbr.
stigmatella (Tuck.) Zahlbr.
subgranulosa (Tuck.) Riddle
subincompta Nyl.
suffusa (Fr.) Schneid.
trachona (Ach.) Lett.
trisepta (Naeg.) Zahlbr.
umbrina (Ach.) Bausch.
verecundula (Th. Fr.) Magn.

Baeomyces Pers.

absolutus Tuck.
fungoides (Sw.) Ach.
placophyllus Ach.
roseus Pers.
rufus (Huds.) Rabenh.

Belonia Körber

americana Fink

Biatorella Th. Fr.

albidula (Willey) Zahlbr.
campestris (Fr.) Th. Fr.
conspersa (Fée) Vain.
cyphalea (Tuck.) Zahlbr.
floridensis Magn.
fossarum (Duf.) Th. Fr.
moriformis (Ach.) Th. Fr.

microhaema Norm.
ochrophora (Nyl.) Arn.
plicata Magn.
rappii Zahlbr.

Blastenia Mass.

atrocyanescens Th. Fr.
diphasia (Tuck.) Zahlbr.
exsecuta (Nyl.) Servít
floridana (Tuck.) Zahlbr.
luteominia (Tuck.) Hasse
rubrofusca B. de Lesd.
sinapisperma (Lam.) Mass.
tetraspora (Nyl.) Th. Fr.

Bombyliospora De Not.

pachycheila (Tuck.) Zahlbr.
porphyrites (Tuck.) Mass.
tuberculosa (Fée) Mass.

Buellia De Not.

alboatra (Hoffm.) Th. Fr.
ambigua (Ach.) Malme
amphidexia Imshaug
badia (Fr.) Mass.
bolacina Tuck.
callispora (Knight) Stein.
caloosensis Tuck.
canescens (Dicks.) De Not.
coniops (Wahlb.) Th. Fr.
curatellae Malme
curtisii (Tuck.) Imshaug
dialyta (Nyl.) Tuck.
elizae (Tuck.) Tuck.
epigaea (Hoffm.) Tuck.
fimbriata (Tuck.) Imshaug
glaziouana (Krempelh.) Müll. **Arg.**
griseovirens (Turn. & Borr.) Almborn
halonia (Ach.) Tuck.
lacteoidea B. de Lesd.
lauricassiae (Fée) Müll. Arg.
lecanoroides Magn.
lepidastra (Tuck.) Tuck.
lepidastroidea Imshaug
leptocline (Flot.) Körber
leucomela Imshaug
maritima (Mass.) Bagl.
moriopsis (Mass.) Th. Fr.
novomexicana B. de Lesd.
oidalea (Nyl.) Tuck.
papillata (Sommerf.) Tuck.
parasema (Ach.) De Not.
penichra (Tuck.) Hasse
pullata Tuck.
pulchella (Schrad.) Tuck.
punctata (Hoffm.) Mass.
radiata Tuck.
rappii Imshaug
retrovertens Tuck.
saxicola B. de Lesd.
schaereri De Not.
semitensis Tuck.
spuria (Schaer.) Anzi
stellulata (Tayl.) Mudd
stigmaea Tuck.
stillingiana Stein.
triphragmioides Anzi
turgescens Tuck.
vernicoma (Tuck.) Tuck.
vilis Th. Fr.
zahlbruckneri Stein.

Byssoloma Trev.

leucoblepharum (Nyl.) Vain.
rotuliforme (Müll. Arg.) Santesson
tricholomum (Mont.) Zahlbr.

Calicium Pers.

abietinum Pers.
adspersum Pers.
albonigrum Nyl.
asikkalense Vain.
curtisii Tuck.
disseminatum (Ach.) Fr.
floerkei Zahlbr.
fuscipes Tuck.
hemisphaericum Howard
lenticulare Ach.
lentigerellum Tuck.
leucochlorum Tuck.
microcephalum (Sm.) Ach.
populneum De Brond.
pusillum (Ach.) Flörke
pusiola Ach.
[*Mycocalicium rappii* Nádv.]
ravenelii Tuck.
[*Mycocalicium reticulatum* Nádv.]
salicinum Pers.
subpusillum Vain.
subtile Pers.
trabinellum Ach.
viride Pers.

Caloplaca Th. Fr.

[*Pyrenodesmia albovariegata* B. de Lesd.]

amabilis Zahlbr.
ammiospila (Ach.) Oliv.
arizonica Magn. *non* Rudolph
arizonica Rudolph *non* Magn.
atrosanguinea (Merr.) Lamb
atroalba (Tuck.) Zahlbr.
aurantiaca (Lightf.) Th. Fr.
bolacina (Tuck.) Herre
bolanderi (Tuck.) Magn.
bracteata (Hoffm.) Jatta
caesiorufa (Ach.) Flag.
californica Zahlbr.
callopisma (Ach.) Th. Fr.
camptidia (Tuck.) Zahlbr.
carolinae Magn.
cascadensis Magn.
catalinae Magn.
celata Th. Fr.
cerina (Ehrh.) Th. Fr.
cinnabarina (Ach.) Zahlbr.
cinnamomea (Th. Fr.) Oliv.
cirrochroa (Ach.) Th. Fr.
citrina (Hoffm.) Th. Fr.
cladodes (Tuck.) Zahlbr.
constipans (Nyl.) Zahlbr.
coralloides (Tuck.) Hult.
discolor (Willey) Fink
dispersa B. de Lesd.
discernenda (Nyl.) Zahlbr.
durietzii Magn.
elegans (Link.) Th. Fr.
eugyra (Tuck.) Zahlbr.
feracissima Magn.
ferruginea (Huds.) Th. Fr.
festiva (Ach.) Zwack
flavovirescens (Wulf.) D. T. & S.
fraudans (Th. Fr.) Oliv.
fraxinea Lamb
fulgens (Sw.) Körber
galactophylla (Tuck.) Zahlbr.
geophila Th. Fr.
groenlandica Lynge
intermedia (B. de Lesd.) Zahlbr.
jungermanniae (Vahl) Th. Fr.
lactea (Mass.) Zahlbr.
laeta Magn.
livida (Hepp) Jatta
lobulata (Flörke) Hellb.
luteominia (Tuck.) Zahlbr.
marina Wedd.
microphylina (Tuck.) Hasse
modesta (Zahlbr.) Fink
[*Pyrenodesmia montana* B. de Lesd.]
murorum (Hoffm.) Th. Fr.
nivalis (Körber) Th. Fr.
[*Blastenia novomexicana* Fink]
obliterans (Nyl.) Jatta
oregana Magn.
oxfordensis Fink
paulsenii (Vain.) Zahlbr.
peliophylla (Tuck.) Zahlbr.
pelodella (Nyl.) Hasse
pinicola Magn.
pollinii (Mass.) Jatta
pyracea (Ach.) Th. Fr.
quercicola Magn.
rubelliana (Ach.) Lojka
schaereri (Flörke) Zahlbr.
scopularis (Nyl.) Lett.
sideritis (Tuck.) Zahlbr.
sipeana Magn.
sorediata (Vain.) Du Rietz
spaldingii Zahlbr.
splendens (Darb.) Zahlbr.
stanfordensis Magn.
stillicidiorum (Vahl) Lynge
subnigricans Magn.
subolivacea (Th. Fr.) Lynge
subpyracella (Nyl.) Zahlbr.
teicholyta (Ach.) Stein.
tetraspora (Nyl.) Oliv.
trachyphylla (Tuck.) Zahlbr.
ulmorum (Fink) Fink
urceolata B. de Lesd.
variabilis (Pers.) Müll. Arg.
verrucosa Hasse
vicaria Magn.
vitellinula (Nyl.) Oliv.
wrightii (Tuck.) Fink
xanthostigmoidea (Räs.) Zahlbr.

Campylothelium Müll. Arg.

nitidum Zahlbr.

Candelaria Mass.

concolor (Dicks.) Arn.
fibrosa (Fr.) Müll. Arg.

Candelariella Müll. Arg.

antennaria Räs.
aurella (Hoffm.) Zahlbr.
cerinella (Vain.) Zahlbr.
citrina B. de Lesd.
crenulata (Wahlb.) Zahlbr.
dispersa (Räs.) Hakulinen

hudsonica Hakulinen
placodizans (Nyl.) Magn.
rosulans (Müll. Arg.) Zahlbr.
spraguei (Tuck.) Zahlbr.
stenospora B. de Lesd.
subdeflexa (Nyl.) Lett.
submexicana B. de Lesd.
vitellina (Ehrh.) Müll. Arg.

Catillaria (Ach.) Th. Fr.

[*Catinaria albocincta* Degelius]
atropurpurea (Schaer.) Th. Fr.
bouteillei (Desm.) Zahlbr.
chalybeia (Borr.) Mass.
cupressi Zahlbr.
endochroma (Fée) Zahlbr.
flavens (Willey) Fink
franciscana (Tuck.) Herre
glauconigrans (Tuck.) Hasse
globulosa (Flörke) Th. Fr.
grossa (Pers.) Körber
griffithii (Sm.) Malme
laureri Hepp
lenticularis (Ach.) Th. Fr.
leptocheila (Tuck.) Ridd.
micrococca (Körber) Th. Fr.
muscicola Lynge
nigroclavata (Nyl.) Schuler
prasina (Fr.) Th. Fr.
terrena (Willey) Zahlbr.

Cavernularia Degelius

hultenii Degelius
lophyrea (Ach.) Degelius

Cetraria Ach.

aurescens Tuck.
canadensis Räs.
chrysantha Tuck.
ciliaris Ach.
commixta (Nyl.) Th. Fr.
crispa (Ach.) Nyl.
cucullata (Bell.) Ach.
delisei (Bory) Th. Fr.
fendleri (Nyl.) Tuck.
glauca (L.) Ach.
hepatizon (Ach.) Vain.
herrei Imshaug
islandica (L.) Ach.
juniperina (L.) Ach.
lacunosa Ach.
merrillii Du Rietz
nigricans (Retz.) Nyl.
nigricascens Elenk.
nivalis (L.) Ach.
norvegica (Lynge) Du Rietz
oakesiana Tuck.
orbata (Nyl.) Fink
pallidula Tuck.
pinastri (Scop.) S. Gray
platyphylla Tuck.
polyschiza (Nyl.) Jatta
richardsonii Hook.
scholanderi Llano
scutata (Wulf.) Poetsch.
sepincola (Ehrh.) Ach.
stenophylla (Tuck.) Merr.
subalpina Imshaug
tilesii Ach.
tuckermanii Oakes

Chaenotheca Th. Fr.

brunneola (Ach.) Müll. Arg.
chrysocephala (Turn.) Th. Fr.
melanophaea (Ach.) Zwack
phaeocephala (Turn.) Th. Fr.
trichialis (Ach.) Th. Fr.

Chiodecton Ach.

montagnaei Tuck.
ochroleucum Zahlbr.
perplexum Nyl.
sphaerale Ach.
subochroleucum Fink

Cladonia (Hill.) Vain.

abbreviatula Merr.
acuminata (Ach.) Vain.
alaskana Evans
alpestris (L.) Rabenh.
alpicola (Flot.) Vain.
amaurocraea (Flörke) Schaer.
apodocarpa Robbins
atlantica **Evans**
bacillaris (Ach.) Nyl.
bacilliformis (Nyl.) Vain.
balfourii Cromb.
beaumontii **(Tuck.) Vain.**
bellidiflora (Ach.) Schaer.
boryi Tuck.
botryocarpa Merr.
botrytes (Hag.) Willd.
brevis Sandst.
caespiticia (Pers.) Flörke
calycantha Del.
capitata (Michx.) Spreng.

carassensis Vain.
cariosa (Ach.) Spreng.
carneola Fr.
caroliniana (Schwein.) Tuck.
cenotea (Ach.) Schaer.
chlorophaea (Flörke) Spreng.
clavulifera Vain.
coccifera (L.) Zopf
coniocraea (Flörke) Sandst.
conista (Ach.) Robbins
cornuta (L.) Schaer.
cornutoradiata (Coem.) Vain.
crispa (Ach.) Flot.
crispata (Ach.) Flot.
cristatella Tuck.
cryptochlorophaea Asahina
cyanipes (Sommerf.) Vain.
cylindrica Evans
decorticata (Flörke) Spreng.
deformis (L.) Hoffm.
degenerans (Flörke) Spreng.
delicata (Ehrh.) Flörke
didyma (Fée) Vain.
digitata Schaer.
ecmocyna (Ach.) Nyl.
elongata (Jacq.) Hoffm.
evansii des Abbayes
farinacea (Vain.) Evans
fimbriata (L.) Fr.
flabelliformis (Flörke) Vain.
flavescens Vain.
floerkeana (Fr.) Flörke
floridana Vain.
furcata (Huds.) Schrad.
glauca Flörke
goneccha (Ach.) Asahina
graciliformis Zahlbr.
gracilis (L.) Willd.
grayi Merr.
herrei Fink
hypoxantha Tuck.
impexa Harm.
incrassata Flörke
invisa Robbins
lepidota Nyl.
leporina Fr.
leptothallina Merr.
linearis Evans
macilenta Hoffm.
macrophyllodes Nyl.
major (Hag.) Sandst.
mateocyatha Robbins
merochlorophaea Asahina
metacorallifera Asahina
mitis Sandst.
multiformis Merr.
nemoxyna (Ach.) Nyl.
nipponica Asahina
norrlinii Vain.
ochrochlora Flörke
pachycladodes Vain.
papillaria (Ehrh.) Hoffm.
perforata Evans
piedmontensis Merr.
pityrea (Flörke)Fr.
pleurota (Flörke) Schaer.
polycarpia Merr.
polydactyla (Flörke) Spreng.
prostrata Evans
pseudomacilenta Asahina
pseudorangiformis Asahina
pyxidata (L.) Fr.
rangiferina (L.) Web.
rangiformis Hoffm.
rappii Evans
ravenelii Tuck.
robbinsii Evans
santensis Tuck.
scabriuscula (Del.) Leight.
simulata Robbins
squamosa (Scop.) Hoffm.
strepsilis (Ach.) Vain.
subcervicornis (Vain.) Du Rietz
subcariosa Nyl.
submitis Robbins
subrangiformis Sandst.
subsetacea Evans
subsquamosa (Nyl.) Vain.
subtenuis (des Abbayes) Evans
sylvatica (L.) Hoffm.
tenuis (Flörke) Harm.
transcendens Vain.
turgida (Ehrh.) Hoffm.
uncialis (L.) Web.
verticillata (Hoffm.) Schaer.
vulcanica Zoll. & Mor.

Clathroporina Müll. Arg.

amygdalina (Müll. Arg.) Fink
diphloea Zahlbr.
exiguella Zahlbr.

Coccocarpia Pers.

cronia (Tuck.) Vain.
incisa Pers.

parmelicides (Hook.) Tuck. *ex* M. A. Curtis
pellita (Ach.) Müll. Arg.

Coenogonium Ehrh.

disjunctum Nyl.
interpositum Nyl.
linkii Ehrh.
moniliforme Tuck.

Collema Web.

auriculatum Hoffm.
bachmanianum (Fink) Degelius
callibotrys Tuck.
callopismum Mass.
ceraniscum Nyl.
coccophorum Tuck.
conglomeratum Hoffm.
crispum (Huds.) Web.
cristatum (L.) Web.
cyrtaspis Tuck.
dubium B. de Lesd.
fasciculare (L.) Web.
fayettense Fink
flaccidum (Ach.) Ach.
fragrans (Sm.) Ach.
furfuraceum (Ach.) Du Rietz
glebulentum (Cromb.) Degelius
laciniatum Nyl.
leptaleum Tuck.
leucocarpum Hook. fil. & Tayl.
leucopeplum (Tuck.) Schneid.
limosum Ach.
microptychium Tuck.
multipartitum Sm.
nigrescens (Huds.) DC.
novomexicanum B. de Lesd.
nylanderianum Zahlbr.
occultatum Bagl.
ohioense (Fink) Zahlbr.
polycarpon Hoffm.
pulchellum Ach.
ryssoleum (Tuck.) Schneid.
subfurfuraceum Degelius
subfurvum (Müll. Arg.) Degelius
tenax (Sw.) Ach.
tunaeforme Ach.
undulatum Flot.
[*Synechoblastus wyomingensis* Fink]

Coniocybe Ach.

furfuracea (L.) Ach.
gracilescens Willey
nivea (Hoffm.) Arn.

Conotrema Tuck.

albonigrum Zahlbr.
urceolatum (Ach.) Tuck.

Coriscium Vain.

viride (Ach.) Vain.

Cornicularia (Schreb.) Ach.

aculeata (Schreb.) Ach.
californica (Tuck.) Du Rietz
divergens Ach.
normoerica (Gunn.) Du Rietz

Crocynia Mass.

aliciae Hue
americana B. de Lesd.
membranacea (Dicks.) Zahlbr.
moxleyi Plitt
neglecta (Nyl.) Hue

Cypheliopsis Vain.

bolanderi (Tuck.) Vain.

Cyphelium Ach.

brachysporum Nádv.
californicum (Tuck.) Zahlbr.
carolinianum (Tuck.) Zahlbr.
chloroconium (Tuck.) Zahlbr.
farlowii (Tuck.) Herre
inquinans (Sm.) Trev.
lucidum Th. Fr.
occidentale Herre
sancti-jacobi (Tuck.) Zahlbr.
sessile (Pers.) Trev.
tigillare Ach.
ventricosulum (Müll. Arg.) Zahlbr.

Dactylina Nyl.

arctica (Richards.) Nyl.
madreporiformis (Wulf.) Tuck.
ramulosa (Hook.) Tuck.

Dendriscocaulon Nyl.

umhausense (Auersw.) Zahlbr.

Dendrographa Darb.

leucophaea (Tuck.) Darb.
minor Darb.

Dermatina Almq.

[*Mycoporum ohioense* (Nyl.) Fink]
pyrenocarpa (Nyl.) Zahlbr.

Dermatiscum Nyl.

catawbense (Willey) Nyl.

Dermatocarpon Eschw.

acarosporoides Zahlbr.
[*Endopyrenium americanum* B. de Lesd.]
[*Endopyrenium bajadanae* B. de. Lesd.]
cinereum (Pers.) Th. Fr.
[*Endopyrenium crustaceum* B. de Lesd.]
fluviatile (Web.) Th. Fr.
granulosum (B. de Lesd.) Zahlbr.
hepaticum (Ach.) Th. Fr.
heppioides Zahlbr.
intestiniforme (Körber) Hasse
lecideoides (Mass.) Hasse
michelii (Mass.) Zwack
miniatum (L.) Mann.
moulinsii (Mont.) Zahlbr.
novomexicanum (B. de Lesd.) Zahlbr.
peltatum (Tayl.) Zahlbr.
plumbeum (B. de Lesd.) Zahlbr.
reticulatum Magn.
rufescens (Ach.) Th. Fr.
rupicola (B. de Lesd.) Zahlbr.
[*Entosthelia saxicola* B. de Lesd.]
squamellum (Nyl.) Herre
tuckermanii (Rav.) Zahlbr.
vagans Imshaug
zahlbruckneri Hasse

Dictyonema Agardh

guadalupense (Rabenh.) Zahlbr.
irpicinum Mont.

Dimerella Trev.

diluta (Pers.) Trev.
lutea (Dicks.) Trev.

Diploschistes Norm.

actinostomus (Pers.) Zahlbr.
albissimus (Ach.) D. T. & S.
canadensis Räs.
scruposus (Schreb.) Norm.

Dirina Fr.

californica Tuck.
catalinariae Hasse
franciscana Zahlbr.
hassei Zahlbr.
rediunta (Stizenb.) Zahlbr.

Endocarpon Hedw.

adscendens (Anzi) Müll. Arg.
lepidallum Nyl.
monicae Zahlbr.
pulvinatum Th. Fr.
pusillum Hedw.
subnitescens Nyl.
tortuosum Herre
wilmsoides Zahlbr.

Ephebe Fr.

lanata (L.) Vain.
solida Born.

Erioderma Fée

mollissimum (Samp.) Du Rietz

Evernia Ach.

divaricata (L.) Ach.
mesomorpha Nyl.
perfragilis Llano
prunastri (L.) Ach.

Forsellia Zahlbr.

minnesotensis (Fink) Fink

Glyphis Ach.

arariana Tuck.
cicatricosa Ach.
confluens Zenk.

Glypholecia Nyl.

scabra (Pers.) Müll. Arg.

Graphina Müll. Arg.

abaphoides (Nyl.) Müll. Arg.
acharii (Fée) Müll. Arg.
acrophaea Müll. Arg.
adscribens (Nyl.) Müll. Arg.
anguina (Mont.) Müll. Arg.
babingtonia (Tuck.) Zahlbr.
dimidiata (Vain.) Zahlbr.
glaucoderma (Nyl.) Müll. Arg.
incrustans (Fée) Müll. Arg.
leprocarpa (Nyl.) Zahlbr.
leuconephela (Nyl.) Zahlbr.
mendax (Nyl.) Müll. Arg.
platycarpa (Eschw.) Zahlbr.
plittii Zahlbr.
scolecitis (Tuck.) Fink
sophisticascens (Nyl.) Zahlbr.
subnitida (Nyl.) Zahlbr.
subnitidula (Nyl.) Zahlbr.
substriatula (Nyl.) Zahlbr.

subvirginalis (Nyl.) Müll. Arg.
virginalis (Tuck.) Müll. Arg.
virginea (Eschw.) Müll. Arg.

Graphis Adans.

afzelii Ach.
atrorubens Tuck.
beaumontii Tuck.
botryosa Tuck.
celtidis Müll. Arg.
elegans (Sm.) Ach.
eulectra Tuck.
floridana Tuck.
intertexta Müll. Arg.
intricata Fée
leucopepla Tuck.
lineola Ach.
mosquitensis Tuck.
nitida (Eschw.) Tuck.
pavoniana Fée
poitaeoides Nyl.
rimulosa (Mont.) Trev.
rufula (Trev.) Mont.
scripta (L.) Ach.
striatula (Ach.) Spreng.
subparilis Nyl.
tenella Ach.
turbulenta Nyl.

Gyalecta Ach.

carneoluteola (Turn.) Oliv.
flotowii Körber
geoica (Wahlb.) Ach.
jenensis (Batsch.) Zahlbr.
peziza (Mont.) Anzi
truncigena (Lam.) Hepp

Gyalectidium Müll. Arg.

filicinum Müll. Arg.
rotuliforme Müll. Arg.

Gyrostomum Fr.

scyphuliferum (Ach.) Fr.

Haematomma Mass.

cismonicum Beltr.
coccineum (Dicks.) Körber
elatinum (Ach.) Mass.
ochrophaeum (Tuck.) Mass.
puniceum (Ach.) Mass.
rappii Zahlbr.
ventosum (L.) Mass.

Hassea Zahlbr.

bacillosa (Nyl.) Zahlbr.

Helminthocarpon Fée

leprevostii Fée

Heppia Naeg.

alumensis Herre
bolanderi (Tuck.) Vain.
deserticola Zahlbr.
euploca (Ach.) Vain.
hassei Zahlbr.
leptopholis Nyl.
lutosa (Ach.) Nyl.
macrospora B. de Lesd.
placodizans Zahlbr.
polyphylla B. de Lesd.
polyspora Tuck.
richardsii Herre
terrena Nyl.
virescens (Despr.) Nyl.
zahlbruckneri Hasse

Herpothallon Tobler

sanguineum (Sw.) Tobler

Heterocarpon Müll. Arg.

ochroleucum (Tuck.) Müll. Arg.

Hydrothyria Russell

venosa Russell

Icmadophila Trev.

ericetorum (L.) Zahlbr.

Ionaspis Th. Fr.

epulotica (Ach.) Th. Fr.
lavata Magn.
ochromicra (Nyl.) Hue
spitsbergensis Magn.

Koerberia Mass.

biformis Mass.

Lasallia Mérat

papulosa (Ach.) Llano
pensylvanica (Hoffm.) Llano
pustulata (L.) Mérat

Laurera Reich.

madreporiformis (Eschw.) Ridd.
megasperma (Mont.) Ridd.
varia (Fée) Zahlbr.
[*Melanotheca wrightii* Müll. Arg.]

Lecanactis Eschw.

abietina (Ehrh.) Körber
amylacea (Ehrh.) Arn.
premnea (Ach.) Arn.
salicina Zahlbr.
zahlbruckneri Herre

Lecania Mass.

albariella (Nyl.) Müll. Arg.
alpivaga Th. Fr.
brunonis (Tuck.) Herre
californica (Zahlbr.) Fink
cyrtella (Ach.) Th. Fr.
dimera (Nyl.) Th. Fr.
dudleyi Herre
erysibe (Ach.) Mudd
fructigena Zahlbr.
nylanderiana Mass.
pepegospora Magn.
perpromixa (Nyl.) Zahlbr.
shastensis Herre
subcaesia (Nyl.) B. de Lesd.
subdispersa (Nyl.) Hasse
syringea (Ach.) Th. Fr.
toninioides Zahlbr.

Lecanora Ach.

alaskensis Magn.
albescens (Hoffm.) Flörke
albomarginata (Nyl.) Cromb.
aleutica Magn.
alphoplaca (Wahlb.) Ach.
alpina Sommerf.
americana (B. de Lesd.) Zahlbr.
anoptiza Nyl.
applegatei Herre
arctica Lynge
atra (Huds.) Ach.
atriseda (Fr.) Nyl.
atrosulphurea (Wahlb.) Ach.
badia (Hoffm.) Ach.
beringii Nyl.
bipruinosa Fink
bockii Rodig.
bolanderi Tuck.
[*Parmularia brouardii* B. de Lesd.]
cadubriae (Mass.) Hedl.
caesiopruinosa Magn.
calcarea (L.) Sommerf.
campestris (Schaer.) Hue
canadensis Lynge & Magn.
candida (Anzi) Nyl.
cascadensis Magn.
castanea (Hepp) Th. Fr.
cenisea Ach.
chlarona (Ach.) Nyl.
cinerea (L.) Sommerf.
cinereorufescens (Ach.) Nyl.
cladonioides Lynge
coilocarpa (Ach.) Nyl.
conizaea (Ach.) Nyl.
contorta (Hoffm.) Stein.
contractula Nyl.
cupressi Tuck.
deplanans Nyl.
diffracta Ach.
discoensis Lynge
dispersa (Pers.) Röhl.
effusa (Pers.) Ach.
elmorei Rudolph
epibryon Ach.
eyerdamii Herre
flavida Hepp
flowersiana Magn.
frustulosa (Dicks.) Ach.
fuscescens (Sommerf.) Nyl.
fuscidula Degelius
gibbosula Magn.
glabrata Ach.
glaucomela Tuck.
glaucophana Nyl.
glaucopsina Nyl.
granatina Sommerf.
grantii Magn.
granulifera (Ach.) Nyl.
hageni (Ach.) Ach.
haydenii Tuck.
hypoptoides Nyl.
hypospilota Vain.
insignis Degelius
intricata (Schrad.) Ach.
iowensis Fink
lacustris (With.) Th. Fr.
laevata (Ach.) Nyl.
laevis Poelt
lentigera (Web.) Ach.
lesleyana Darb.
limitata Magn.
lividolutea Räs.
louisianae B. de Lesd.
marginalis Hasse
maxima Lynge
melaena (Hedl.) Fink
melanaspis (Ach.) Th. Fr.
melanophthalma (DC.) Ram.

microbola Lamb
miculata Ach.
minutella Nyl.
monticola Magn.
muralis (Schreb.) Rabenh.
mutabilis (Ach.) Nyl.
myrini (Th. Fr.) Tuck. *ex* **M. A. Curtis**
narssaquensis Lynge
nevadensis Magn.
nigromarginata Magn.
nephaea Sommerf.
novomexicana Magn.
[*Parmularia novomexicana* B. de Lesd.]
olivaceopallida Magn.
oregana Tuck.
pacifica Tuck.
pallida (Schreb.) Rabenh.
parisensis Nyl.
perradiata Nyl.
pertusa Lynge
phaeobola Tuck.
phacophora (Stizenb.) Magn.
phryganitis Tuck.
pinastri (Schaer.) Magn.
piniperda Körber
pinguis Tuck.
poluninii Lynge
polytropa (Ehrh.) Rabenh.
praecrenata Nyl.
pringlei (Tuck.) Lamb
radiosa (Hoffm.) Schaer.
riparia Merr.
rubina (Vill.) Ach.
rugosella Zahlbr.
rupicola (L.) Zahlbr.
salina Magn.
sambuci (Pers.) Nyl.
sanguinea (Krempelh.) Mig.
semitensis Tuck.
sipeana Magn.
straminea (Wahlb.) Ach.
subfusca (L.) Ach.
subfuscata Magn.
subintricata Th. Fr.
subpallida Merr.
subrugosa Nyl.
superfluens Magn.
tenuis Magn.
tetraspora Magn.
thallophila Magn.
thamnitis Tuck.
thamnoplaca Tuck.
thomsonii Magn.
tristiuscula Magn.
umbrina (Ehrh.) Mass.
utahensis Magn.
varia (Ehrh.) Ach.
verrucosa (Ach.) Laur.
versicolor (Pers.) Ach.
willeyi Tuck.
wisconsinensis Magn.

Lecidea Ach.

acrocyanea (Th. Fr.) Magn.
adirondackii Magn.
aenea (Duf.) Th. Fr.
aglaea Sommerf.
aitema Ach.
albidocinerella Vain.
albocaerulescens (Wulf.) Ach.
albofuscescens Nyl.
albosuffusa Th. Fr.
aleutica Degelius
amabilis B. de Lesd.
[*Psora americana* B. de Lesd.]
amniculensis Lowe
amylacea (Ach.) Tuck.
aniptiza Stirt.
anthracophila Nyl.
antoniensis Magn.
arctogena Th. Fr.
armeniaca (DC.) Fr.
assimilata Nyl.
atomaria Th. Fr.
atrobrunnea (Ram.) Schaer.
atrofusca (Flot.) Mudd
atrolutescens Nyl.
atromarginata Magn.
auriculata Th. Fr.
baffiniana Magn.
berengeriana (Mass.) Th. Fr.
botryosa (Fr.) Th. Fr.
brachyspora (Th. Fr.) Nyl.
brandegei Tuck.
brouardii (B. de Lesd.) Zahlbr.
brujeriana (Schaer.) Leight.
brunneofusca Magn.
caeca Lowe
caesioatra Schaer.
calcivora (Ehrh.) Nyl.
californica Zahlbr.
carneoalbens Nyl.

carnulenta (Tuck.) Fink
cascadensis Magn.
catalinariae Stizenb.
caulophylla (Tuck.) Zahlbr.
cellularis Lowe
cinerata Zahlbr.
cinereoatra Ach.
cinereorufa Schaer.
cinnabarina Sommerf.
coarctata (Sm.) Nyl.
columbiana Magn.
columnata Lowe
conferenda Nyl.
confluens (Wigg.) Ach.
congesta Fink
coroniformis Krempelh.
crassipes (Th. Fr.) Nyl.
crenata (Tayl.) Stizenb.
cruciaria Tuck.
crustulata (Ach.) Spreng.
cuprea Sommerf.
cyanescens Lynge
cyathoides Ach.
cyrtidia Tuck.
decipiens (Ehrh.) Ach.
degelii Magn.
delincta Nyl.
deminutula Magn.
demissa (Rustr.) Ach.
despecta Th. Fr.
diapensiae Th. Fr.
dicksonii (Gmel.) Ach.
dilutiuscula Nyl.
diversa Lowe
dolodes Nyl.
eckfeldtii Zahlbr.
elabens Fr.
elata Schaer.
ementiens Nyl.
enteroleuca Ach.
erratica Körber
erythrophaea Flörke
euphorea (Flörke) Nyl.
evansii Magn.
flavidolivens (Tuck.) Fink
flavocaerulescens (Hornem) Ach.
flexuosa (Fr.) Nyl.
floridensis Nyl.
friesii Ach.
fuliginosa Tayl.
furfuracea Pers.
furfurosa Tuck.
furva Lowe
furvella Nyl.
furvonigrans (Tuck.) Zahlbr.
fuscatoatra Nyl.
fuscoatra (L.) Ach.
fuscocinerea Nyl.
gelatinosa Flörke
glaucophaea Körber
glebulosa (Fr.) Clem.
globifera Ach.
glomerulosa (DC.) Steud.
goniophila Flörke
goniophiloides B. de Lesd.
granulata Magn.
granulosa (Ehrh.) Ach.
gyrodes Magn.
hassei Zahlbr.
hebescens Nyl.
helvola (Körber) Th. Fr.
holopolia (Tuck.) Zahlbr.
homalodes Nyl.
homosema Nyl.
humilis Lowe
humosa (Ehrh.) Nyl.
hypomela Nyl.
hypopta Ach.
icterica (Mont.) Tayl.
impavida Th. Fr.
intropallida Fink
intumescens (Flörke) Nyl.
katahdinensis Degelius
kochiana Hepp
labradorica Arn.
lacus-crateris Magn.
lapicida Ach.
latypea Ach.
leucophaea (Flörke) Nyl.
limosa Ach.
lithophila (Ach.) Th. Fr.
lithosperma Zahlbr.
lowensis Magn.
lucida Ach.
lugubris Sommerf.
lulensis (Hellb.) Stizenb.
lurida (Dill.) Ach.
luridella Tuck.
lynceola Th. Fr.
lyngei Degelius
mamillana Tuck.
mannii Tuck.
marciensis Lowe
marylandensis Magn.

melaphanoides Nyl.
melinodes (Körber) Magn.
merrillii Magn.
micytho Tuck.
misella Nyl.
mollis (Wahlb.) Nyl.
monticola Schaer.
moreliensis B. de Lesd.
mutabilis Fée
myriocarpella (Merr.) Zahlbr.
myriocarpoides Nyl.
nearingii Magn.
nemoralis Lowe
[*Psora novomexicana* B. de Lesd.]
nylanderi (Anzi) Th. Fr.
oblongula Magn.
obtegens Th. Fr.
olivacea (Hoffm.) Mass.
olivascens Th. Fr.
orosthea Ach.
pacifica Herre
paddensis (Tuck.) Zahlbr.
panaeola Ach.
pantherina (Ach.) Th. Fr.
parvifolia Pers.
paupercula Th. Fr.
peliaspis (Tuck.) Zahlbr.
pelybotrya (Wahlb.) Leight.
petri (Tuck.) Zahlbr.
phylliscina Nyl.
placidensis Magn.
plana Lahm
planetica Tuck.
plebeja Nyl.
polaris Lynge
praeruptorum Du Rietz & Magn.
prasinula (Wedd.) B. de Lesd.
promiscens Nyl.
protabacina Nyl.
pulla Lowe
pumicicola Magn.
punctella (Willd.) Zahlbr.
pycnocarpa (Körber) Ohlert
quernea (Dicks.) Arn.
ramulicola Magn.
ramulosa Th. Fr.
recensa Stirt.
rivulorum Magn.
rubiformis Wahlb.
rufofusca (Anzi) Nyl.
rufonigra (Tuck.) Nyl.
rugosa Lowe
russellii Tuck.
russula Ach.
sanguineoatra (Wulf.) Ach.
santae-monicae Magn.
scalaris Ach.
scotopholis (Tuck.) Herre
scrobiculata Th. Fr.
scrupulosa (Eckf.) Magn.
silacea Ach.
soredifera Lowe
speirea Ach.
sphacelata Th. Fr.
steriza (Ach.) Vain.
stigmatea Ach.
subauriculata B. de Lesd.
subcontinuior B. de Lesd.
suberratica Lowe
subplebeja Vain.
subplumbea Anzi
subramosa Lowe
subsimplex Magn.
subtilis Degelius
sylvicola Flot.
symmicta (Ach.) Ach.
tenayucae B. de Lesd.
tennessensis Nyl.
tesselata Flörke
tesselina Tuck.
tonoensis Nyl.
torquens Müll. Arg.
trochodes (Tayl.) Leight.
truckeei Herre
tumida Mass.
turgidula Fr.
uliginosa (Schrad.) Ach.
ultima Th. Fr.
varians Ach.
vernalis (L.) Ach.
violascens Magn.
virginiensis Calkins & Nyl.
viridescens (Schrad.) Ach.
vorticosa (Flörke) Körber
vulgata Zahlbr.
wallrothii Flörke
washingtonensis Magn.
wulfenii (Hepp) Arn.
xanthococcoides Zahlbr.

Lempholemma Körber

cladodes (Tuck.) Zahlbr.
myriococcum (Ach.) Th. Fr.
oblique-peltatum (Eschw.) Dodge
umbella (Tuck.) Zahlbr.

Lepraria Ach.
aeruginosa (Wigg.) Sm.
candelaris (L.) Fr.
chlorina Ach.

Leptogidium Nyl.
dendriscum Nyl.

Leptogium (Ach.) S. Gray
americanum Degelius
apalachense Nyl.
arizonicum Zahlbr.
azureum (Ach.) Mont.
bullatum (Ach.) Mont.
burgessii (L.) Mont.
byssinum (Hoffm.) Nyl.
californicum Tuck.
caesiellum Tuck.
chloromelum (Sw.) Nyl.
corticola (Tayl.) Tuck.
crenatellum Tuck.
cyanescens (Ach.) Körber
dactylinum Tuck.
hildenbrandii (Garov.) Nyl.
juniperinum Tuck.
lichenoides (L.) Zahlbr.
lividofuscum (Flörke) Flot.
marginellum (Sw.) S. Gray
minutissimum (Flörke) Fr.
nanum Herre
palmatum (Huds.) Mont.
perminutum Fink
phyllocarpum (Pers.) Mont.
pilosellum Merr.
platynum (Tuck.) Herre
plectenchymum Fink
plicatile (Ach.) Leight
saturninum (Dicks.) Nyl.
schraderi (Bernh.) Nyl.
sinuatum (Huds.) Mass.
tenuissimum (Dicks.) Körber
tenuiusculum (Wallr.) Arn.

Leptorhaphis Körber
contorta Degelius
epidermidis (Ach.) Th. Fr.
quercus (Beltr.) Körber

Leptotrema Mont. & Bosch.
auberianum (Mont.) Fink
glaucescens (Nyl.) Müll. Arg.
heterosporum (Knight.) Zahlbr.
laeviusculum (Nyl.) Zahlbr.
monosporum (Nyl.) Müll. Arg.
ravenelii (Tuck.) Fink
santense (Tuck.) Zahlbr.
wightii (Tayl.) Müll. Arg.

Letharia (Th. Fr.) Zahlbr.
californica (Lév.) Hue
vulpina (L.) Hue

Lichina Agardh
confinis (Müll.) Agardh

Lobaria Schreb.
crosa (Zahlbr.) Nyl.
hallii (Tuck.) Zahlbr.
laetevirens (Lightf.) Zahlbr.
linita (Ach.) Rabenh.
oregana (Tuck.) Müll. Arg.
pulmonaria (L.) Hoffm.
quercizans Michx.
scrobiculata (Scop.) DC.

Lopadium Körber
augustinii (Tuck.) Zahlbr.
dodgei Herre
domingense (Pers.) Fink
fuscoluteum (Hoffm.) Mudd
leucoxanthum (Spreng.) Zahlbr.
pezizoideum (Ach.) Körber
puiggarii (Müll. Arg.) Zahlbr.
vulpinum (Tuck.) Zahlbr.

Maronea Mass.
carolinae Magn.
constans (Nyl.) Hepp
polyphaea (Tuck.) Magn.
porinoidea Zahlbr.

Massalongia Körber
carnosa (Dicks.) Körber

Medusilina Müll. Arg.
texana Müll. Arg.

Megalospora Mey.
versicolor (Fée) Zahlbr.

Melanaria Erichs.
macounii Lamb

Melanotheca Fée
achariana Fée
aggregata (Fée) Müll. Arg.
concatervans (Nyl.) Zahlbr.
cruenta (Mont.) Müll. Arg.

esenbeckiana Fée
subincruenta (Nyl.) Zahlbr.

Melaspilea Nyl.

amota Nyl.
arthonioides (Fée) Nyl.
cinerascens (Willey) Fink
constrictella (Stirt.) A. L. Sm.
cupularis Müll. Arg.
deformis (Schaer.) Nyl.
demissa (Tuck.) Zahlbr.
lentiginosula (Nyl.) A. L. Sm.
maculosa (Fr.) Müll. Arg.
octomera Müll. Arg.
proximella (Nyl.) Nyl.
stellans Zahlbr.
tribuloides (Tuck.) Müll. Arg.

Microglaena Körber

hassei Zahlbr.
inductula (Nyl.) Servít
sordidula Th. Fr.
sphinctrinoides (Nyl.) Lönnr.
subcorallina Hasse
sychnogonoides Zahlbr.

Microthelia Körber

aterrima (Anzi) Zahlbr.
inops Degelius
melanostigma Th. Fr.
micula Körber
oblongata Müll. Arg.
oxyspora Zahlbr.
thelena (Ach.) Trev.
willeyana Müll. Arg.

Monoblastia Ridd.

rappii Zahlbr.

Mycoblastus Norm.

marginatus Degelius
melinus (Krempelh.) Hellb.
sanguinarius (L.) Norm.

Mycoporellum Müll. Arg.

californicum Zahlbr.
difforme (Minks) Fink
hassei Zahlbr.
sparsellum (Nyl.) Müll. Arg.

Nephroma Ach.

arcticum (L.) Torss.
bellum (Spreng.) Tuck.
expallidum (Nyl.) Nyl.
helveticum Ach.
laevigatum Ach.
parile (Ach.) Ach.
plittii Gyel.
protoresupinatum Gyel.
rameum (Schaer.) Mass.
resupinatum (L.) Ach.

Neuropogon Nees & Flot.

lambii Imshaug
sulphureus (König) Hellb.

Normandina Nyl.

pulchella (Borr.) Nyl.

Ocellularia Mey.

carnea (Eckf.) Zahlbr.
domingensis (Fée) Müll. Arg.
floridensis Fink
granulosa (Tuck.) Zahlbr.
lathraea (Tuck.) Zahlbr.
micropora (Mont.) Müll. Arg.
subtilis (Tuck.) Ridd.

Ochrolechia Mass.

androgyna (Hoffm.) Arn.
arborea (Kreyer) Almborn
frigida (Sw.) Lynge
grimmiae Lynge
inaequatula (Nyl.) Zahlbr.
oregonensis Magn.
pacifica Magn.
pallescens (L.) Mass.
protuberans (Stirt.) Zahlbr.
subathallina Magn.
tartarea (L.) Mass.
upsaliensis (L.) Mass.
yasudae Vain.

Omphalodiscus Scholander

crustulosus (Ach.) Scholander
decussatus (Vill.) Scholander
kraschenninikovii (Sav.) Scholander
virginis (Schaer.) Scholander

Omphalodium Mey.

arizonicum (Tuck. *ex* Willey) Tuck.

Opegrapha Humb.

agelaea Fée
astraea Tuck.
atra Pers.
betulina Sm.
bonplandii Fée
calcarea Turn.

candida Müll. Arg.
cinerea Chev.
diaphora Ach.
diaphoroides Nyl.
filicina Mont.
hassei Zahlbr.
leucoplaca Müll. Arg.
lichenoides Pers.
lithyrga Ach.
longissima Müll. Arg.
microcycla Tuck.
prosodea Ach.
pulicaris (Hoffm.) Nyl.
rufescens Pers.
saxicola Ach.
umbellulariae Zahlbr.
viridis Pers.
vulgata Ach.

Pachyphiale Lönnr.

fagicola (Hepp) Zwack

Pannaria Del.

halei Tuck.
hookeri (Borr.) Nyl.
isidiata Degelius
leucosticta (Tuck.) Tuck.
lurida (Mont.) Nyl.
mariana (Fr.) Müll. Arg.
melamphylla Tuck.
pezizoides (Web.) Trev.
pityrea (DC.) Degelius
rubiginosa (Thunb.) Del.
sonomensis Tuck.
waghornei Eckf.

Parmelia Ach.

allardii Hale
alpicola Th. Fr.
amazonica Nyl.
arnoldii Du Rietz
arsenicana Gyel.
aspera Mass.
aurulenta Tuck.
austerodes Nyl.
austrosinensis Zahlbr.
bolliana Müll. Arg.
borreri (Sm.) Turn.
californica Gyel.
caperata (L.) Ach.
caroliniana Nyl.
centrifuga (L.) Ach.
cetrarioides (Del. *ex* Duby) Nyl.
cetrata Ach.
chlorochroa Tuck.
cirrhata Fr.
cladonia (Tuck.) Du Rietz
confoederata Culberson
conspersa (Ach.) Ach.
crinita Ach.
cristifera Tayl.
crozalsiana B. de Lesd.
cryptochlorophaea Hale
darrowii Thomson
delavayi Hue
disjuncta Erichs.
dissecta Nyl.
dominicana Vain.
elegantula (Zahlbr.) Räs.
encausta (Sm.) Ach.
enteromorpha Ach.
epiclada Hale
exasperata (Ach.) Nyl.
exasperatula Nyl.
flaventior Stirt.
formosana Zahlbr.
fraudans Nyl.
frondifera Merr.
furfuracea (L.) Ach.
galbina Ach.
graminicola B. de Lesd.
haitiensis Hale
hubrichtii Berry
hypotropa Nyl.
incorrupta Moore
incurva (Pers.) Fr.
infumata Nyl.
intestiniformis (Vill.) Ach.
isidiata (Anzi) Gyel.
isidiosa (Müll. Arg.) Hale *non* Vain.
laevigata (Sm.) Ach.
latissima Fée
leiocarpa Tayl.
lindmanii Lynge
lineola Berry
livida Tayl.
lobulifera Degelius
macrocarpoides Vain.
madagascariacea (Hue) des Abbayes
margaritata Hue
maxima Hue
michauxiana Zahlbr.
molliuscula Ach.
multispora Schneid.
negativa Gyel.

neoconspersa Gyel.
njalensis Dodge
novomexicana Gyel.
obsessa Ach.
olivacea (L.) Ach.
olivetorum Nyl.
omphalodes (L.) Ach.
oregana Gyel.
panniformis (Nyl.) Vain.
perforata (Jacq.) Ach.
perlata (Huds.) Ach.
perreticulata (Räs.) Hale
pertusa (Schrank) Schaer.
physodes (L.) Ach.
plittii Gyel.
praesignis Nyl.
praesorediosa Nyl.
prolixa (Ach.) Röhl.
pseudoborreri Asahina
pseudosulcata Gyel.
quercina (Willd.) Vain.
relicina Fr.
reticulata Tayl.
revoluta Flörke
robusta Degelius
rudecta Ach.
saxatilis (L.) Ach.
scortella Nyl.
separata Th. Fr.
sipeana Gyel.
sorediosa Almborn
sorocheila Vain.
sphaerospora Nyl.
sphaerosporella Müll. Arg.
stenophylla (Ach.) Heug.
stygia (L.) Ach.
subargentifera Nyl.
subarnoldii des Abbayes
subaurifera Nyl.
subcrinita Nyl.
subinvoluta Hale
subisidiosa (Müll. Arg.) Dodge
subobscura Vain.
subolivacea Nyl.
subtinctoria Zahlbr.
sulcata Tayl.
sulphurata Nees & Flot.
texana Tuck.
tinctorum Despr. *ex* Nyl.
tuberculata Gyel.
tubulosa (Hag.) Bitt.
ulophyllodes (Vain.) Savicz
vittata (Ach.) Nyl.
zollingeri Hepp

Parmeliella Müll. Arg.

cheiroloba Müll. Arg.
corallinoides (Hoffm.) Zahlbr.
crossophylla (Tuck.) Merr. & Burnh.
cyanolepra (Tuck.) Herre
lepidiota (Sommerf.) Vain.
microphylla (Sw.) Müll. Arg.
plumbea (Lightf.) Müll. Arg.
ruderatula (Nyl.) Hasse
stellata (Nyl.) Zahlbr.

Parmeliopsis Nyl.

aleurites (Ach.) Lett.
ambigua (Wulf.) Nyl.
hyperopta (Ach.) Vain.
placorodia (Ach.) Nyl.

Parmentaria Fée

astroidea Fée
rappii Zahlbr.
ravenelii (Tuck.) Müll. Arg.

Peccania (Mass.) Forss.

arizonica (Tuck.) Herre
kansana (Tuck.) Forss.

Peltigera Pers.

aphthosa (L.) Willd.
canina (L.) Willd.
degenii Gyel.
evansiana Gyel.
horizontalis (Huds.) Baumg.
lepidophora (Nyl.) Vain.
malacea (Ach.) Funck
membranacea (Ach.) Nyl.
polydactyla (Neck.) Hoffm.
pulverulenta (Tayl.) Nyl.
scutata (Dicks.) Duby
venosa (L.) Baumg.

Perforaria Müll. Arg.

minuta Degelius

Pertusaria DC.

alaskensis Erichs.
aleutensis Erichs.
alpina Hepp
amara (Ach.) Nyl.
ambigens (Nyl.) Tuck.
atra Lynge
borealis Erichs.

bryontha (Ach.) Nyl.
bryophaga Erichs.
ceuthocarpoides Zahlbr.
concentrica Erichs.
copiosa Erichs.
coriacea Th. Fr.
dactylina (Ach.) Nyl.
diffusilis Erichs.
disticha Erichs.
excludens Nyl.
finkii Zahlbr.
flavicunda Tuck.
freyi Erichs.
globularis (Ach.) Tuck.
granulata (Ach.) Müll. Arg.
hultenii Erichs.
laevigata (Nyl.) Arn.
lecanina Tuck.
leioplaca (Ach.) DC.
leioterella Erichs.
leucostoma (Bernh.) Mass.
lutescens (Hoffm.) Lam.
marginata Nyl.
multipuncta (Turn.) Nyl.
neoscotica Lamb
nolens Nyl.
octomela (Norm.) Erichs.
oculata (Dicks.) Th. Fr.
panyrga (Ach.) Mass.
papillata Tuck.
pertusa (L.) Tuck.
plittiana Erichs.
propinqua Müll. Arg.
protuberans (Sommerf.) Th. Fr.
pruinifera Erichs.
pustulata (Ach.) Duby
rhexostoma Nyl.
rubefacta Erichs.
rubescens Erichs.
subobducens Nyl.
tabuliformis Erichs.
taeniata Erichs.
tetrathalamia (Fée) Nyl.
texana Müll. Arg.
torquata Müll. Arg.
trachythallina Erichs.
tuckermanii Erichs.
velata (Turn.) Nyl.
wulfenii DC.
xanthodes Müll. Arg.
xanthostoma (Sommerf.) Fr.
zeorina Erichs.

Phaeographina Müll. Arg.
caesiopruinosa (Fée) Müll. Arg.
columbiana (Tuck.) Zahlbr.
explicans Fink
plurifera (Nyl.) Fink
scalpturata (Ach.) Müll. Arg.

Phaeographis Müll. Arg.
dendritica (Ach.) Müll. Arg.
dentriticella Müll. Arg.
erumpens (Nyl.) Müll. Arg.
haematites (Fée) Müll. Arg.
intricans (Nyl.) Vain.
inusta (Ach.) Müll. Arg.
lobata (Eschw.) Müll. Arg.
punctiformis (Eschw.) Müll. Arg.
subfulgurata (Nyl.) Zahlbr.
tortuosa (Ach.) Müll. Arg.

Phaeotrema Müll. Arg.
californicum (Tuck.) Zahlbr.

Phlyctella Krempelh.
andensis Nyl.

Phlyctidia Müll. Arg.
ludoviciensis Müll. Arg.

Phlyctis Flot.
agelaea (Ach.) Flot.
argena (Ach.) Flot.
willeyi Tuck.

Phylliscum Nyl.
demangeonii (Moug.) Nyl.

Phyllopsora Müll. Arg.
subcorallina Zahlbr.
subfilamentosa Zahlbr.

Physcia Ach.
adscendens (Th. Fr.) Oliv.
aegialita (Ach.) Nyl.
aipolia (Ehrh.) Hampe
alba (Fée) Müll. Arg.
albicans (Pers.) Thomson
albinea (Ach.) Nyl.
aspera Magn.
astroidea (Clem.) Nyl.
biziana (Mass.) Zahlbr.
caesia (Hoffm.) Hampe
callosa Nyl.
cascadensis Magn.
ciliata (Hoffm.) Du Rietz

clementii (Sm.) Lynge
constipata (Nyl.) Norrl. & Nyl.
convexa Müll. Arg.
culbersonii Thomson
dubia (Hoffm.) Lett.
elaeina (Sm.) A. L. Sm.
endococcinea (Körber) Th. Fr.
frostii (Tuck.) Zahlbr.
grisea (Lam.) Zahlbr.
halei Thomson
intermedia Vain.
leana Tuck.
leptalea (Ach.) DC.
leucoleiptes (Tuck.) Lett.
lithotodes Nyl.
mexicana B. de Lesd.
millegrana Degelius
muscigena (Ach.) Nyl.
nigricans (Flörke) Stizenb.
orbicularis (Neck.) Thomson
phaea (Tuck.) Thomson
picta (Sw.) Nyl.
pseudospeciosa Thomson
pulverulenta (Schreb.) Hampe
purpurascens Vain.
sciastra (Ach.) Du Rietz
setosa (Ach.) Nyl.
stellaris (L.) Nyl.
subobscura (Nyl.) Nyl.
subtilis Degelius
syncolla Tuck.
tenella (Scop.) DC.
teretiuscula (Ach.) Lynge
tribacia (Ach.) Nyl.
tribacoides Nyl.
vainioi **Räs.**

Physma Mass.

cataractaecola B. de Lesd.

Pilophoron (Tuck.) Th. Fr.

***aciculare* (Ach.) Nyl.**
cereolus (Ach.) Nyl.
hallii (Tuck.) Vain.

Placopsis Nyl.

gelida (L.) Nyl.

Placynthium S. Gray

asperellum (Ach.) Trev.
dubium Herre
flabellosum (Tuck.) Zahlbr.
microphyllizum (Nyl.) Hasse
nigrum (Huds.) S. Gray
petersii (Nyl.) Burnh.
stenophyllum (Tuck.) Fink
subnigrum B. de Lesd.

Platygraphopsis Müll. Arg.

interrupta (Fée) Müll. Arg.

Pleurotheliopsis Zahlbr.

nana Zahlbr.

Pleurotrema Müll. Arg.

solivagum Degelius

Polyblastia (Mass.) Lönnr.

bryophila Lönnr.
hyperborea Th. Fr.
intercedens (Nyl.) Lönnr.
intergrascens (Nyl.) Vain.
obsoleta Arn.
septentrionalis Lynge
sommerfeltii Lynge

Polyblastiopsis Zahlbr.

dealbens Fink
dispora (Müll. Arg.) Zahlbr.
fallaciosa (Stizenb.) Zahlbr.
***fallax* (Nyl.) Fink**
floridana Fink
inductula (Nyl.) Fink
intrusa (Nyl.) Zahlbr.
lactea (Mass.) Zahlbr.
rappii Zahlbr.

Polychidium (Ach.) S. Gray

albociliatum (Desm.) Zahlbr.
muscicola (Sw.) S. Gray
***rivale* (Tuck.) Fink**

Porina Ach.

carpinea (Pers.) Zahlbr.
cestrensis (Tuck.) Müll. Arg.
chlorotica (Ach.) Müll. Arg.
cinerea (Pers.) Zahlbr.
lectissima (Fr.) Zahlbr.
mastoidea (Ach.) Müll. Arg.
nucula Ach.
olivacea (Borr.) A. L. Sm.
plumbaria (Stizenb.) Hasse
rhaphidosperma Müll. Arg.
salicina Müll. Arg.
subcinerea (Nyl.) Zahlbr.
thaxteri Santesson
viridiseda (Nyl.) Zahlbr.

Porocyphus Körber
furfurellus (Nyl.) Forss.

Protoblastenia (Zahlbr.) Stein.
rupestris (Scop.) Stein.

Pseudocyphellaria Vain.
anomala Magn.
aurata (Ach.) Vain.
crocata (L.) Vain.
mougeotiana (Del.) Vain.
rainierensis Imshaug

Pseudopyrenula Müll. Arg.
pupula (Ach.) Müll. Arg.

Psoroma Nyl.
hypnorum (Vahl) S. Gray

Psorotichia (Mass.) Forss.
hassei Fink
segregata (Nyl.) Hasse
squamulosa Zahlbr.

Pyrenastrum Eschw.
pyrenastraeum (Nyl.) Zahlbr.

Pyrenopsidium Forss.
granuliforme (Nyl.) Forss.

Pyrenopsis Nyl.
compacta Willey
fuscoatra Fink
haemaleella (Nyl.) Blomb. & Forss.
lecideella Fink
melambola Tuck.
phaeococca Tuck.
phylliscina Tuck.
polycocca (Nyl.) Tuck.
pulvinata (Schaer.) Th. Fr.
sanguinea Anzi
schaereri (Mass.) Nyl.
subfuliginea Nyl.
viridirufa Tuck.

Pyrenothrix Ridd.
nigra Ridd.

Pyrenula Ach.
aspistea (Afz.) Ach.
bahiana Malme
brunnea Fée
cerina Eschw.
glabrata (Ach.) Mass.
herrei Fink
leucoplaca (Wallr.) Körber
mamillana (Ach.) Trev.
nitida (Weig.) Ach.
subaggregata Müll. Arg.

Pyrgillus Nyl.
americanus Nyl.
javanicus Nyl.

Pyxine Fr.
berteriana (Fée) Imshaug
caesiopruinosa (Tuck.) Imshaug
cocoes (Sw.) Nyl.
eschweileri (Tuck.) Vain.
pringlei Imshaug
sorediata (Ach.) Mont.

Racodium Pers.
rupestre Pers.

Ramalina Ach.
almquistii Vain.
calicaris (L.) Fr.
ceruchis (Ach.) De Not.
combeoides Nyl.
complanata (Sw.) Ach.
crinita Tuck.
dilacerata (Hoffm.) Vain.
duriaei (De Not.) Bagl.
ecklonii (Spreng.) Mey. & Flot.
evernioides Nyl.
farinacea (L.) Ach.
fastigiata (Pers.) Ach.
fraxinea (L.) Ach.
geniculata Nyl.
homalea Ach.
inflata Hook. & Tayl.
intermedia Nyl.
leptocarpha Tuck.
linearis (Sw.) Ach.
menziesii Tuck.
montagnei De Not.
peruviana Ach.
pollinaria (Westr.) Ach.
polymorpha Ach.
reticulata (Noedh.) Krempelh.
rigida Ach.
roesleri (Hochst.) Hue
scoparia Vain.
sinensis Jatta
stenospora Müll. Arg.
subamplicata (Nyl.) Fink
subpellucida Müll. Arg.

tennis (Tuck.) Merr.
testudinaria Nyl.
thrausta (Ach.) Nyl.
usnea (L.) Howe
willeyi Howe

Ramonia Stizenb.

venezuelicma (Mont.) Stizenb.

Reinkella Darb.

californica Räs.
subcrustacea Räs.

Rhizocarpon DC.

athalloides (Nyl.) Hasse
atroalbescens (Nyl.) Zahlbr.
badioatrum (Flörke) Th. Fr.
bolanderi (Tuck.) Herre
chionophilum Th. Fr.
chlorophaeum (Hepp) Müll. Arg.
cinereovirens (Müll. Arg.) Vain.
concentricum (Dav.) Beltr.
cookeanum Magn.
copelandii (Körber) Th. Fr.
disporum (Naeg.) Müll. Arg.
distinctum Th. Fr.
cupetreaum (Nyl.) Arn.
expallescens Th. Fr.
ferax Magn.
geminatum (Flot.) Körber
geographicum (L.) DC.
grande (Flörke) Arn.
hochstetteri (Körber) Vain.
inarense (Vain.) Vain.
intermedium Degelius
interponens (Nyl.) Zahlbr.
jemtlandicum Malme
lavatum (Ach.) Arn.
lecanorinum (Körber) Anders
lindsayanum Räs.
obscuratum (Ach.) Mass.
oederi (Web.) Körber
oreites (Vain.) Zopf.
parvum Runemark
plicatile (Leight.) A. L. Sm.
polycarpoides Degelius
postumum (Nyl.) Th. Fr.
reductum Th. Fr.
rittokense (Hellb.) Th. Fr.
sublucidum Räs.
subtile Runemark
superficiale (Schaer.) Vain.
tetramerum Vain.
vernicomoideum Fink
viridiatrum (Wulf.) Körber

Rinodina (Ach.) S. Gray

adirondackii Magn.
americana B. de Lesd.
angelica Stizenb.
annulata Magn.
applanata Magn.
archaea (Ach.) Vain.
ascociscana Tuck.
aterrima Krempelh.
athallina Magn.
atrocinerea (Dicks.) Arn.
biatorina Körber
bischoffii (Hepp) Mass.
bolanderi Magn.
bolodes Tuck.
brouardii B. de Lesd.
californica Magn.
chrysomelaena Tuck.
coloradiana Magn.
confragosa (Ach.) Körber
conradii Körber
constrictula Magn.
corticola Arn.
dakotensis Magn.
darrovii Rudolph
destitula (Nyl.) Zahlbr.
curyspora Zahlbr.
exigua (Ach.) S. Gray
finkii Magn.
granuligera Magn.
halei Magn.
hallii Tuck.
herrei Magn.
inaequalis Magn.
intermedia Bagl.
kentuckyensis Fink
laevigata (Ach.) Malme
lecanoides B. de Lesd.
lepida (Nyl.) Müll. Arg.
lycopodiicola B. de Lesd.
marysvillensis Magn.
microbola Tuck.
milliaria Tuck.
milvina (Wahlb.) Th. Fr.
minutissima B. de Lesd.
myiaraea (Ach.) Körber
nigra Fink
nimbosa (Fr.) Th. Fr.
novomexicana B. de Lesd.

ocellata (Hoffm.) Arn.
ochrocea Willey
oregana Magn.
orcina (Ach.) Mass.
pachysperma Magn.
papillata Magn.
pennsylvanica Magn.
platyloba Willey
polyspora Th. Fr.
populicola Magn.
pyrina (Ach.) Arn.
pyriniformis Magn.
radiata (Tuck.) Tuck.
roboris (Duf.) Arn.
roscida (Sommerf.) Lynge
salina Degelius
santae-monicae Magn.
silicicola B. de Lesd.
subminuta Magn.
suborcina B. de Lesd.
subplumbea Magn.
subsophodes (Nyl.) Zahlbr.
tetraspis (Tuck.) Herre
thysanota Tuck.
turfacea Körber
vegasii B. de Lesd.

Roccella DC.

decipiens Darb.
difficilis Darb.
fuciformis (L.) DC.
montagnaei Bel.
phycopsis Ach.
tinctoria DC.

Sarcographa Fée

labyrinthica (Ach.) Müll. Arg.
medusulina (Nyl.) Müll. Arg.
tricosa (Ach.) Müll. Arg.

Sarcogyne Flot.

athroocarpa Magn.
bicolor Magn.
bolleana Magn.
californica Magn.
clavus (Ram.) Krempelh.
dakotensis Magn.
integra (B. de Lesd.) Magn.
[*Biatorella kuleshanensis* Herre]
magnussonii B. de Lesd.
novomexicana Magn.
oligospora Magn.
privigna (Ach.) Anzi
pruinosa (Sm.) Körber
similis Magn.
simplex (Dav.) Nyl.

Schismatomma Mass.

cupressum Herre
hypothallinum (Zahlbr.) Hasse
ocellatum (Nyl.) Zahlbr.
pericleum (Ach.) Branth & Rostr.
pluriloculare Zahlbr.
ravenelii (Tuck.) Zahlbr.
subattingens (Nyl.) Zahlbr.
vernans (Tuck.) Zahlbr.

Schizopelte Th. Fr.

californica Th. Fr.

Sclerophyton Eschw.

californicum (Tuck.) Hasse
inscriptum (Nyl.) Müll. Arg.
occidentale Herre

Siphula Fr.

ceratites (Wahlb.) Fr.
dactyliza Nyl.
simplex (Tayl.) Nyl.

Solenopsora Mass.

candicans (Fr.) Zahlbr.
crenata (Herre) Zahlbr.
hassei Zahlbr.

Solorina Ach.

bispora Nyl.
crocea (L.) Ach.
octospora Arn.
saccata (L.) Ach.
spongiosa (Sm.) Anzi

Sphaerophorus Pers.

fragilis (L.) Pers.
globosus (Huds.) Vain.
melanocarpus (Sw.) DC.
tuckermanii Räs.

Spilonema Born.

paradoxum Born.

Sporostatia Mass.

cinerea (Schaer.) Körber
testudinea (Ach.) Mass.

Staurothele Norm.

circinata Tuck.
clopima (Wahlb.) Th. Fr.
diffractella (Nyl.) Tuck.

fuscocuprea (Nyl.) Zwack
glacialis Herre
lecideoides B. de Lesd.
perradiata Lynge
rufa (Mass.) Zsch.
sessilis Magn.
tenuissima Degelius
umbrina (Ach.) Tuck.

Stenocybe Nyl.

[? *Spinctrinella calicioides* **Nádv.**]
major Nyl.
pullatula (Ach.) Stein.
tremulicola Norrl.

Stereocaulon (Schreb.) Hoffm.

albicans Fr.
alpinum Laur.
botryosum Ach.
condensatum Hoffm.
dactylophyllum Flörke
depreaultii Del.
evolutoides (Magn.) Frey
glareosum (Sav.) Magn.
glaucescens Tuck.
incrustatum Flörke
intermedium (Sav.) Magn.
leprocephalum Vain.
microscopicum (Vill.) Frey
nanodes Tuck.
paschale (L.) Hoffm.
pileatum Ach.
rivulorum Magn.
subalbicans Lamb
subcoralloides Nyl.
tennesseense Magn.
tomentosum Fr.
vesuvianum Pers.
wrightii Tuck.

Sticta Schreb.

anthraspis Ach.
arctica Degelius
fuliginosa (Dicks.) Arn.
limbata (Sm.) Ach.
sylvatica (Huds.) Ach.
weigelii (Ach.) Vain.

Strigula Fr.

complanata (Fée) Mont.
elegans (Fée) Müll. Arg.

Synalissa Fr.

symphorea (Ach.) Nyl.

Tapellaria Müll. Arg.

epiphylla (Müll. Arg.) Santesson

Teloschistes Norm.

chrysophthalmus (L.) Th. Fr.
euplocus (Tuck.) Zahlbr.
exilis (Michx.) Vain.
flavicans (Sw.) Norm.
villosus (Ach.) Norm.

Thamnolia Ach.

subvermicularis Asahina
vermicularis (Sw.) Ach.

Thelidium Mass.

areolatum Thomson
microbolum (Tuck.) Hasse
microsporum Lynge
pyrenophorum (Ach.) Mudd

Thelocarpon Nyl.

albomarginatum Herre
fimicola Fink
hassei B. de Lesd.
intermediellum Nyl.
laureri (Flot.) Nyl.
majusculum Nyl.
superellum Nyl.

Thelopsis Nyl.

subporinella Nyl.

Thelotrema Ach.

interpositum (Nyl.) Müll. Arg.
lepadinum (Ach.) Ach.
sanfordianum Zahlbr.

Thermutis Fr.

velutina (Ach.) Flot.

Thrombium Wallr.

discordans (Nyl.) Zahlbr.
epigaeum (Pers.) Wallr.

Thryea Mass.

girardii (Dur. & Mont.) Bagl. & Carr.
pyrenoides (Nyl.) Fink

Toninia (Mass.) Th. Fr.

aromatica (Turn.) Mass.
caeruleonigricans (Lightf.) Th. Fr.
candida (Web.) Th. Fr.
caulescens Anzi
cumulata (Sommerf.) Th. Fr.
lobulata (Sommerf.) Lynge

massata (Tuck.) Herre
ruginosa (Tuck.) Herre
squalida (Schleich.) Mass.

Trimmatothele Norm.

umbellulariae Herre

Trypethelium Spreng.

aeneum (Eschw.) Zahlbr.
catervarium (Fée) Tuck.
eluteriae Spreng.
exocanthum Tuck.
mastoideum Ach.
ochroleucum (Eschw.) Nyl.
pallescens Fée
scorites Tuck.
tropicum (Ach.) Müll. Arg.
virens Tuck.

Umbilicaria Hoffm.

angulata Tuck.
aprina Nyl.
arctica (Ach.) Nyl.
caroliniana Tuck.
cinereorufescens (Schaer.) Frey
cylindrica (L.) Del.
deusta (L.) Baumg.
havaasii Llano
hirsuta (Sw.) Ach.
hyperborea (Ach.) Hoffm.
lambii Imshaug
mammulata (Ach.) Tuck.
phaea Tuck.
polyphylla (L.) Baumg.
proboscidea (L.) Schrad.
torrefacta (Lightf.) Schrad.
vellea (L.) Ach.

Usnea Wigg.

aculeata Mot.
affinis Mot.
amabilis Mot.
angulata Ach.
antillarum (Vain.) Zahlbr.
arizonica Mot.
australis Fr.
betulina Mot.
californica Herre
capillaris Mot.
caucasica Vain.
cavernosa Tuck.
ceratina Ach.
ciliifera Mot.
cirrosa Mot.
comosa (Ach.) Röhl.
compacta Mot.
dasypoga (Ach.) Röhl.
deformis Mot.
dimorpha (Müll. Arg.) Mot.
distincta Mot.
duriuscula Mot.
esthonica Räs.
evansii Mot.
fibrillosa Mot.
flagellata Mot.
florida (L.) Wigg.
freyi Mot.
fulvoreagens (Räs.) Mot.
furfurosula (Zahlbr.) Mot.
glabrata (Ach.) Vain.
glabrescens (Nyl.) Vain.
hesperina Mot.
hirta (L.) Wigg.
implicata (Stirt.) Zahlbr.
intermedia (Mass.) Jatta
kujalae Räs.
lapponica Vain.
laricina Vain.
leucosticta Vain.
longissima Ach.
merrillii Mot.
mirabilis Mot.
mollis Stirt.
monstruosa Vain.
montana Mot.
mutabilis Stirt.
occidentalis Mot.
pachyclada Mot.
pensylvanica Mot.
perplectans Stirt.
prostrata (Vain.) Räs.
ramillosa Mot.
retifera Mot.
rubicunda Stirt.
rugulosa Vain.
scabiosa Mot.
scabrata Nyl.
scholanderi Llano
similis Mot.
sorediifera Mot.
spinulifera (Vain.) Mot.
strigosa (Ach.) Eaton
stuppea (Räs.) Mot.
subclavata Mot.
subfusca Stirt.
sublaxa Mot.

subscabrosa Nyl.
sylvatica Mot.
trichodea Ach.
tristis Mot.
vainioi Mot.
variolosa Mot.

Verrucaria Wigg.

acrotella Ach.
aethiobola Wahlb.
aquilella Nyl.
arctica Lynge
calciseda DC.
calkinsiana Servit
canella Nyl.
ceuthocarpa Wahlb.
dacryodes Nyl.
divergens Nyl.
erichsenii Zsch.
fayettensis Servit
finkiana Servit
fuscella (Turn.) Ach.
hydrela Ach.
macrostoma Duf.
margacea Wahlb.
marmorea (Scop.) Arn.
maura Wahlb.
melas Herre
microspora Nyl.
mucosa Wahlb.
mutabilis Borr.
nigrescens Pers.
nigrescentoidea Fink
novomexicana B. de Lesd.
obsoleta Lynge
papillosa Ach.
phaeothelena Th. Fr.
pinguicula Mass.
pseudonigrescens Servit
rupestris Schrad.
silicicola Fink
sorbicola Servit
sordida Fink
stanfordii Herre
striatula Wahlb.
subglaucina B. de Lesd.
submersella Servit
submuralis Nyl.
subsuperficialis Fink
umbrinula Nyl.
virens Nyl.
viridula (Schrad.) Ach.

Xanthoria (Fr.) Th. Fr.

candelaria (L.) Arn.
fallax (Hepp) Arn.
hasseana Räs.
parietina (L.) Th. Fr.
polycarpa (Ehrh.) Rieb.
oregana Gyel.
ramulosa (Tuck.) Herre

Xylographa Fr.

abietina (Pers.) Zahlbr.
disseminata Willey
hians Tuck.
opegraphella Nyl.

Zahlbrucknerella Herre

calcarea Herre

Synonyms and Excluded Names in the North American Literature

Acarospora cervina auct. (North American records) = misidentifications
Acarospora cineracea auct. (North American records) = apparently misidentifications
Acarospora flava (Bell.) Trev. = *Acarospora chlorophana* (Wahlb.) Mass.
Acarospora geophila Magn. = *Acarospora geogena* Magn.
Acarospora glebosa (Flot.) Körber = *Acarospora oligospora* (Hepp) Arn.
Acarospora rhabarbarina Hue = *Acarospora bella* (Nyl.) Jatta
Acarospora saxicola Fink = *Glypholecia scabra* (Pers.) Müll. Arg.
Acarospora scabra (Pers.) Th. Fr. = *Glypholechia scabra* (Pers.) Müll. Arg.
Acarospora squamulosa (Schrad.) Trev. = *Acarospora macrospora* (Hepp) Bagl.
Alectoria altaica (Gyel.) Räs. = *Alectoria nadvornikiana* Gyel.
Alectoria chalybeiformis auct. = *Alectoria nidulifera* Norrl.
Alectoria divergens (Ach.) Nyl. = *Cornicularia divergens* Ach.

Alectoria thrausta Ach. = *Ramalina thrausta* (Ach.) Nyl.
Alectoria virens Tayl. = *Alectoria tortuosa* Merr.
Allarthonia caesia Flot. = *Arthonia caesia* (Flot.) Körber
Amphiloma lanuginosum (Hoffm.) Nyl. = *Crocynia membranacea* (Dicks.) Zahlbr.
Anaptychia aquila auct. = *Anaptychia palmatula* (Michx.) Vain.
Anaptychia comosa auct. = *Anaptychia galactophylla* (Tuck.) Trev.
Anaptychia hypoleuca var. *colorata* Zahlbr. = *Anaptychia heterochroa* Vain.
Arthonia gregaria (Weig.) Körber = *Arthonia cinnabarina* (DC.) Wallr.
Arthopyrenia alba (Schrad.) Zahlbr. = *Arthopyrenia gemmata* (Ach.) Mass.
Arthopyrenia litoralis (Leight.) Arn. = *Arthopyrenia sublitoralis* (Leight.) Arn.
Bacidia affinis (Zwack) Vain. = *Bacidia subincompta* Nyl.
Bacidia lugubris (Sommerf.) Zahlbr. = *Lecidea lugubris* Sommerf.
Bacidia minuscula Anzi = *Bacidia beckhausii* Körber
Biatora spp. = *Lecidea* (sect. BIATORA) spp.
Biatorella clavus (Ram.) Th. Fr. = *Sarcogyne clavus* (Ram.) Krempelh.
Biatorella hypophaea (Nyl.) Blomb. & Forss. = *Sarcogyne privigna* (Ach.) Anzi f. *hymenogonia* Magn.
Biatorella pruinosa (Sm.) Th. Fr. = *Sarcogyne pruinosa* (Sm.) Körber
Biatorella resinae (Fr.) Th. Fr. = a fungus
Biatorella simplex (Dav.) Branth. & Rostr. = *Sarcogyne simplex* (Dav.) Nyl.
Biatorella testudinea (Ach.) Mass. = *Sporostatia testudinea* (Ach.) Mass.
Bilimbia spp. = *Bacidia* (sect. BILIMBIA) spp.
Bilimbia caudata (Nyl.) Fink = *Lecidea lugubris* Sommerf.
Bilimbia tricholoma (Mont.) Fink = *Byssoloma tricholomum* (Mont.) Zahlbr.
Blastenia atrosanguinea (Merr.) Herre = *Caloplaca atrosanguinea* (Merr.) Lamb
Blastenia fraudans (Th. Fr.) B. de Lesd. = *Caloplaca fraudans* (Th. Fr.) Oliv.
Blastenia novomexicana Fink, see under *Caloplaca*
Buellia aethalea (Ach.) Th. Fr., excluded as doubtful
Buellia badioatra (Flörke) Körber = *Rhizocarpon badioatrum* (Flörke) Th. Fr.
Buellia blumeri Zahlbr. = *Buellia retrovertens* Tuck.
Buellia colludens (Nyl.) Arn. = *Rhizocarpon hochstetteri* (Körber) Vain.
Buellia conspirans (Nyl.) Vain. = *Buellia curatellae* Malme
Buellia coracina (Hoffm.) Th. Fr. = *Buellia moriopsis* (Mass.) Th. Fr.
Buellia fosteri Imshaug = *Buellia callispora* (Knight) Stein.
Buellia hassei Imshaug = *Buellia griseovirens* (Turn. & Borr.) Almborn
Buellia isidians (Nyl.) Zahlbr., excluded as doubtful
Buellia langloisii Imshaug = *Buellia leucomela* Imshaug
Buellia myriocarpa (DC.) De Not. = *Buellia punctata* (Hoffm.) Mass.
Buellia pruinella Imshaug = *Buellia fimbriata* (Tuck.) Imshaug
Buellia pullata Tuck. = *Buellia punctata* (Hoffm.) Mass.
Buellia radiata Tuck. = *Rinodina radiata* (Tuck.) Tuck.
Buellia rinodinoides auct. (North American records) = misidentifications
Buellia rinodinospora Ridd. = *Buellia callispora* (Knight) Stein.
Buellia scabrosa (Ach.) Mass. = a fungus
Buellia thomae (Tuck.) Imshaug = *Buellia glaziouana* (Krempelh.) Müll. Arg.

Buellia turgescentoides Fink = *Buellia turgescens* Tuck.
Buellia tusconensis Zahlbr. = *Buellia retrovertens* Tuck.
Buelliella spp. = fungi
Buelliopsis papillata (Sommerf.) Fink = *Buellia papillata* (Sommerf.) Tuck.
Buelliopsis vernicoma (Tuck.) Schneid. = *Buellia vernicoma* Tuck.
Caliciella spp. = fungi
Calicium hyperellum Ach. = *Calicium viride* Pers.
Calicium roscidum auct. = *Calicium adspersum* Pers.
Calicium roscidum var. *trabinellum* (Ach.) Schaer. = *Calicium trabinellum* Ach.
Calicium trachelinum Ach. = *Calicium salicinum* Pers.
Caloplaca erythrella (Ach.) Kieffer = *Caloplaca flavovirescens* (Wulf.) D. T. & S.
Caloplaca gilva (Hoffm.) Zahlbr. = *Caloplaca cerina* (Ehrh.) Th. Fr. f. *gilva* (Hoffm.) Th. Fr.
Candelariella epixantha (Ach.) Sandst. = *Candelariella aurella* (Hoffm.) Zahlbr.
Catillaria herrei (Hepp) Fink = a fungus
Catillaria tricolor (With.) Th. Fr. = *Catillaria griffithii* (Sm.) Malme
Catinaria laureri (Hepp) Degelius = *Catillaria laureri* Hepp
Catinaria leucoplaca (DC.) Zahlbr. = *Catillaria grossa* (Pers.) Körber
Cetraria aculeata (Schreb.) Fr. = *Cornicularia aculeata* (Schreb.) Ach.
Cetraria atlantica (Tuck.) Du Rietz = *Cetraria tuckermanii* Oakes *non* Herre
Cetraria californica Tuck. = *Cornicularia californica* (Tuck.) Du Rietz
Cetraria chlorophylla (Willd.) Vain. = *Cetraria scutata* (Wulf.) Poetsch.
Cetraria fahlunensis (L.) Schreb. = *Cetraria commixta* (Nyl.) Th. Fr.
Cetraria hiascens (Fr.) Th. Fr. = *Cetraria delisei* (Bory) Th. Fr.
Cetraria lacunosa Ach. var. *atlantica* Tuck. = *Cetraria tuckermanii* Oakes *non* Herre
Cetraria tristis (Web.) Fr. = *Cornicularia normoerica* (Gunn.) Du Rietz
Cetraria tuckermannii Herre *non* Oakes = *Cetraria herrei* Imshaug
Chiodecton inscriptum (Nyl.) Fink = *Sclerophyton inscriptum* (Nyl.) Müll. Arg.
Chiodecton sanguineum (Sw.) Vain. = *Herpothallon sanguineum* (Sw.) Tobler
Cladonia borbonica (Del.) Nyl. *pro parte* = *Cladonia cylindrica* Evans
Cladonia cerasphora Vain. = *Cladonia degenerans* (Flörke) Spreng.
Cladonia endoxantha Vain. = *Cladonia hypoxantha* Tuck.
Cladonia exasperatula Merr. = *Cladonia beaumontii* (Tuck.) Vain.
Cladonia foliacea auct. (North American records) = misidentifications
Cladonia gracilescens (Flörke) Vain. = *Cladonia lepidota* Nyl.
Cladonia microphylliza Merr. = *Cladonia beaumontii* (Tuck.) Vain.
Cladonia mitrula Tuck. = *Cladonia capitata* (Michx.) Spreng.
Cladonia palamaea (Ach.) Fink = *Cladonia multiformis* Merr.
Cladonia pycnoclada auct. (North American records) = mostly *Cladonia evansii* des Abbayes and *Cladonia subtenuis* (des Abbayes) Evans
Cladonia reticulata (Russell) Vain. = *Cladonia boryi* Tuck.
Cladonia scabriuscula (Del.) Leight. *pro parte* = *Cladonia farinacea* (Vain.) Evans
Cladonia symphycarpa auct. = a *nomen ambiguum*
Cladonia terrae-novae Ahti = a *nomen nudum*

Collema granosum ("Wulf.") Rabenh. = *Collema auriculatum* Hoffm.
Collema arcticum Lynge = *Collema ceraniscum* Nyl.
Collema cheilum Ach. = *Collema crispum* (Huds.) G. H. Web.
Collema cristatellum Tuck. = *Collema tenax* (Sw.) Ach. var. *corallinum* (Mass.) Degelius
Collema furvum (Ach.) Ach. = *Collema tunaeforme* Ach.
Collema glaucescens Hoffm. = *Collema limosum* Ach.
Collema granosum (Schreb.) Rabenh. = (?) *Physcia* sp.
Collema microphyllum Ach. = *Collema fragrans* (Sm.) Ach.
Collema plicatile Ach. = *Leptogium plicatile* (Ach.) Leight.
Collema pulposum (Bernh.) Ach. = *Collema tenax* (Sw.) Ach.
Collema pustulatum Ach. = *Collema cristatum* (L.) G. H. Web.
Collema pycnocarpum Nyl. = *Collema conglomeratum* Hoffm. var. *crassiusculum* (Malme) Degelius
Collema verruciforme (Ach.) Nyl., excluded as doubtful
Collemodes bachmanianum Fink = *Collema bachmanianum* (Fink) Degelius
Coniocybe pallida (Pers.) Fr. = *Conicoybe nivea* (Hoffm.) Arn.
Cora pavonia (Web.) Fr., apparently not in our area
Dermatocarpon aquaticum (Weis.) Zahlbr. = *Dermatocarpon fluviatile* (Web.) Th. Fr.
Dermatocarpon arborcum (Schwein.) Fink = *Dermatocarpon tuckermanii* (Rav.) Zahlbr.
Dermatocarpon polyphyllum (Wulf.) D. T. & S. = *Dermatocarpon intestiniforme* (Körber) Hasse
Dufourea madreporiformis (Wulf.) Ach. = *Dactylina madreporiformis* (Wulf.) Tuck.
Endocarpon pallidum Ach. = *Endocarpon ascendens* (Anzi) Müll. Arg.
Enterostigma montagnei (Tuck.) Fink = *Chiodecton montagnei* Tuck.
Evernia ceratea (Ach.) Zopf = *Parmelia furfuracea* (L.) Ach. var. *ceratea* Ach.
Evernia ceratea (Ach.) Zopf var. *cladonia* (Tuck.) Fink = *Parmelia cladonia* (Tuck.) Du Rietz
Evernia furfuracea (L.) Mann. = *Parmelia furfuracea* (L.) Ach.
Evernia thamnodes (Flot.) Arn. = *Evernia mesomorpha* Nyl.
Evernia vulpina (L.) Ach. = *Letharia vulpina* (L.) Vain.
Fulgensia bracteata (Hoffm.) Räs. = *Caloplaca bracteata* (Hoffm.) Jatta
Gasparrinia spp. = *Caloplaca* spp.
Gyrophora angulata (Tuck.) Herre = *Umbilicaria angulata* Tuck.
Gyrophora anthracina (Wulf.) Körber = *Agyrophora rigida* (Du Rietz) Llano
Gyrophora arctica Ach. = *Umbilicaria arctica* (Ach.) Nyl.
Gyrophora cylindrica (L.) Ach. = *Umbilicaria cylindrica* (L.) Del.
Gyrophora decussata (Vill.) Zahlbr. = *Omphalodiscus decussatus* (Vill.) Scholander
Gyrophora deusta (L.) Ach. = *Umbilicaria deusta* (L.) Baumg.
Gyrophora dillenii (Tuck.) Müll. Arg. = *Umbilicaria mammulata* (Ach.) Tuck.
Gyrophora crosa (Web.) Ach. = *Umbilicaria torrefacta* (Lightf.) Schrad.
Gyrophora grisea Sw. = *Umbilicaria hirsuta* (Sw.) Ach.
Gyrophora hyperborea Ach. = *Umbilicaria hyperborea* (Ach.) Hoffm.
Gyrophora muhlenbergii Ach. = *Actinogrya muhlenbergii* (Ach.) Scholander
Gyrophora phaea (Tuck.) Nyl. = *Umbilicaria phaea* Tuck.

Gyrophora polyphylla (L.) Fink = *Umbilicaria polyphylla* (L.) Baumg.
Gyrophora polyrrhiza (L.) Körber = *Actinogyra polyrrhiza* (L.) Scholander
Gyrophora torrefacta (Lightf.) Cromb. = *Umbilicaria torrefacta* (Lightf.) Schrad.
Gyrophora vellea (L.) Ach. = *Umbilicaria vellea* (L.) Ach.
Heppia guepini (Del.) Nyl. = *Heppia euploca* (Ach.) Vain.
Ionaspis odora auct. (North American records) = probably misidentifications
Lecanactis illecebrosa (Duf.) Fr. = *Lecanactis amylacea* (Ehrh.) Arn.
Lecanora atrynea (Ach.) Röhl. = *Lecanora cenisea* Ach. f. *atrynea* (Ach.) Stein.
Lecanora circinata (Pers.) Ach. = *Lecanora radiosa* (Hoffm.) Schaer.
Lecanora epulotica (Ach.) Nyl. = *Ionaspis epulotica* (Ach.) Th. Fr.
Lecanora gelida (L.) Ach. = *Placopsis gelida* (L.) Nyl.
Lecanora gibbosa (Ach.) Nyl. = *Lecanora gibbosula* Magn.
Lecanora lavata (Magn.) Fink = *Ionaspis lavata* Magn.
Lecanora odora auct. [= *Ionaspis odora* (Ach.) Th. Fr.] (North American records) = probably misidentifications
Lecanora orosthea (Ach.) Ach. = *Lecidea orosthea* (Ach.) Ach.
Lecanora rugosa (Pers.) Nyl. = *Lecanora rugosella* Zahlbr.
Lecanora sordida (Pers.) Th. Fr. = *Lecanora rupicola* (L.) Zahlbr.
Lecanora symmicta Ach. = *Lecidea symmicta* (Ach.) Ach.
Lecidea arctica Sommerf. = *Lecidea caesioatra* Schaer.
Lecidea arcuatula Nyl. = *Lecidea recensa* Stirt.
Lecidea cadubriae (Mass.) Nyl. = *Lecanora cadubriae* (Mass.) Hedl.
Lecidea caesiocoronata Lowe = *Lecidea olivascens* Th. Fr.
Lecidea cyanea (Ach.) Röhl. = *Lecidea tesselata* Flörke
Lecidea fusca (Schaer.) Th. Fr. = *Lecidea atrofusca* (Flot.) Mudd
Lecidea fuscescens Sommerf. = *Lecanora fuscescens* (Sommerf.) Nyl.
Lecidea fuscorubens Nyl. = *Lecidea monticola* Schaer.
Lecidea leucophaeoides Nyl. = *Lecidea lulensis* (Hellb.) Stizenb.
Lecidea melancheima Tuck.= *Lecidea elabens* Fr.
Lecidea neglecta Nyl. = *Crocynia neglecta* (Nyl.) Hue
Lecidea parasema Ach. = *Lecidea euphorea* (Flörke) Nyl. *pro parte*
Lecidea phaeophora Stizenb. = *Lecanora phaeophora* (Stizenb.) Magn.
Lecidea platycarpa Ach. = *Lecidea steriza* (Ach.) Vain.
Lecidea pringlei Tuck.= *Lecanora pringlei* (Tuck.) Lamb
Lecidea pruinosa Ach. = *Lecidea lithophila* (Ach.) Th. Fr.
Lecidea recedens Nyl. = a fungus
Lecidea rivulosa Ach. = *Lecidea cythoides* Ach.
Lecidea sorediza Nyl. = *Lecidea tumida* Mass.
Lecidea soredizodes (Nyl.) Vain. = *Lecidea glaucophaea* Körber
Leptogium albociliatum Desm. = *Polychidium albociliatum* (Desm.) Zahlbr.
Leptogium caesium (Ach.) Vain. = *Leptogium cyanescens* (Ach.) Körber
Leptogium pulchellum (Ach.) Nyl. = *Leptogium corticola* (Tayl.) Tuck.
Leptogium rhyparodes Nyl. = *Collema callopismum* Mass., var. *rhyparodes* (Nyl.) Degelius
Leptogium scotinum (Ach.) Fr. = *Leptogium sinuatum* (Huds.) Mass.
Leptogium tremelloides (L.) S. F. Gray = *Leptogium cyanescens* (Ach.) Körber
Lepraria flava (Schreb.) Ach. = *Lepraria candelaris* (L.) Fr.
Lobaria verrucosa (Huds.) Hoffm. = *Lobaria scrobiculata* (Scop.) DC.

Lopadiopsis floridana Zahlbr. = *Gyalectidium rotuliforme* Müll. Arg.
Lopadium phyllocharis (Mont.) Fink = *Tapellaria epiphylla* (Müll. Arg.) Santesson
Microphiale diluta (Pers.) Zahlbr. = *Dimerella diluta* (Pers.) Trev.
Microphiale lutea (Dicks.) Zahlbr. = *Dimerella lutea* (Dicks.) Trev.
Mycocalicium albonigrum (Nyl.) Fink = *Calicium albonigrum* Nyl.
Mycocalicium disseminatum (Ach.) Fink = *Calicium disseminatum* (Ach.) Fr.
Mycocalicium fuscipes (Tuck.) Fink = *Calicium fuscipes* Tuck.
Mycocalicium microcephalum (Sm.) Fink = *Calicium microcephalum* (Sm.) Ach.
Mycocalicium parietinum (Ach.) Vain. = *Calicium subtile* Pers.
Mycocalicium ravenelii (Tuck.) Fink = *Calicium ravenelii* Tuck.
Mycoporum ohiense (Nyl.) Fink, see under *Dermatina*
Mycoporum pyrenocarpum Nyl. = *Dermatina pyrenocarpa* (Nyl.) Zahlbr.
Nephroma laevigatum auct. = *Nephroma bellum* (Spreng.) Tuck.
Nephroma lusitanicum auct. = *Nephroma laevigatum* Ach.
Nephroma subtomentellum (Nyl.) Gyel. = *Nephroma bellum* (Spreng.) Tuck.
Nephroma washingtoniense Gyel. = *Nephroma bellum* (Spreng.) Tuck.
Nesolechia spp. = fungi
Opegrapha herpetica Ach. = *Opegrapha rufescens* Pers.
Opegrapha varia Pers. = *Opegrapha pulicaris* (Hoffm.) Nyl.
Opegraphoidea spp. = fungi
Pannaria granatina (Sommerf.) Th. Fr. = *Lecanora granatina* Sommerf.
Pannaria rubiginosa (Thunb.) Del. var. *lanuginosa* (Hoffm.) Zahlbr. = *Pannaria pityrea* (DC.) Degelius
Parmelia andreana Müll. Arg. = *Parmelia flaventior* Stirt.
Parmelia arizonica (Tuck. *ex* Willey) Nyl. = *Omphalodium arizonicum* (Tuck. *ex* Willey) Tuck.
Parmelia aspidota (Ach.) Röhl. = *Parmelia exasperata* (Ach.) Nyl.
Parmelia atrofusca (Schaer.) Cromb. = *Parmelia alpicola* Th. Fr.
Parmelia baltimorensis Gyel. = *Parmelia caperata* (L.) Ach.
Parmelia chrysantha Tuck. = *Parmelia madagascariacea* (Hue) des Abbayes
Parmelia colpodes Ach. = *Anzia colpodes* (Ach.) Stizenb.
Parmelia conspurcata (Schaer.) Vain. = *Parmelia subargentifera* Nyl.
Parmelia coralloides (Mey. & Flot.) Vain. = *Parmelia tinctorum* Despr. *ex* Nyl.
Parmelia cubensis Nyl. = *Parmelia sphaerospora* Nyl.
Parmelia dubia (Wulf.) Ach. = *Parmelia borreri* (Sm.) Turn.
Parmelia endoxantha Merr. = *Parmelia sphaerospora* Nyl.
Parmelia erecta Berry = *Parmelia perforata* (Jacq.) Ach.
Parmelia finkii Zahlbr. = *Parmelia obsessa* Ach.
Parmelia flavicans (Tuck.) Tuck. = *Parmelia caperata* (L.) Ach.
Parmelia franklinana Tayl. = *Cetraria pinastri* (Scop.) S. Gray
Parmelia herreana Zahlbr. = *Parmelia caperata* (L.) Ach.
Parmelia hypotropodes Nyl. = *Parmelia perforata* (Jacq.) Ach.
Parmelia hypotropoides Nyl. = *Parmelia perforata* (Jacq.) Ach.
Parmelia lanata (L.) Wallr. = *Alectoria pubescens* (L.) Howe
Parmelia leucochlora Tuck. = *Parmelia sphaerospora* Nyl.
Parmelia lophyrea Ach. = *Cavernularia lophyrea* (Ach.) Degelius
Parmelia manshurica Asahina = *Parmelia ulophyllodes* (Vain.) Savicz

Parmelia olivaria "Hue" = *Parmelia olivetorum* Nyl.
Parmelia olivaria (Ach.) Th. Fr. = *Parmelia reticulata* Tayl.
Parmelia proboscidea Tayl. = *Parmelia crinita* Ach.
Parmelia recipienda Nyl. (North American records) = misidentifications
Parmelia submarginalis (Michx.) Ach. = *Parmelia michauxiana* Zahlbr.
Parmelia subquercifolia Hue = *Parmelia galbina* Ach.
Parmelia subrugata Krempelh. (North American records) = misidentifications
Parmelia sulphurosa (Tuck.) Fink = *Parmelia galbina* Ach.
Parmelia trichotera Hue = *Parmelia perlata* (Huds.) Ach.
Parmeliopsis americana Hillm. = *Parmeliopsis placorodia* (Ach.) Nyl.
Parmeliopsis diffusa (Weber) Riddle = *Parmeliopsis hyperopta* (Ach.) Vain.
Parmeliopsis marylandica Gyel. = *Parmeliopsis placorodia* (Ach.) Nyl.
Parmeliopsis subambigua Gyel. = *Parmeliopsis ambigua* (Wulf.) Nyl.
Peltigera praetextata (Flörke) Vain. = *Peltigera canina* (L.) Willd. var. *rufescens* (Weis.) Mudd f. *innovans* (Körber) Thomson
Peltigera rufescens (Weis.) Humb. = *Peltigera canina* (L.) Willd. var. *rufescens* (Weis.) Mudd.
Peltigera scabrosa Th. Fr. = *Peltigera pulverulenta* (Tayl.) Nyl.
Peltigera sorediata (Schaer.) Fink = *Peltigera canina* (L.) Willd. var. *spuria* (Ach.) Schaer. f. *sorediata* Schaer.
Peltigera spuria (Ach.) DC. = *Peltigera canina* (L.) Willd. var. *spuria* (Ach.) Schaer.
Peltigera zopfii Gyel. = *Peltigera horizontalis* (Huds.) Baumg.
Pertusaria canadensis Stirt. = *Pertusaria pustulata* (Ach.) Duby
Pertusaria carneopallida (Nyl.) Nyl. = *Pertusaria protuberans* (Sommerf.) Th. Fr.
Pertusaria ceuthocarpa (Sm.) Turn. & Borr. = *Pertusaria ceuthocarpoides* Zahlbr.
Pertusaria glomerata auct. = *Pertusaria tuckermanii* Erichs.
Physcia adglutinata (Flörke) Nyl. = *Physcia elaeina* (Sm.) A. L. Sm.
Physcia brouardii B. de Lesd. = a *nomen ambiguum*
Physcia crispa (Pers.) Nyl. = *Physcia albicans* (Pers.) Thomson
Physcia endochrysea (Hampe) Nyl. = *Physcia orbicularis* (Neck.) Poetsch. f. *rubropulchra* Degelius
Physcia hispida (Schreb.) Frege = *Physcia tenella* (Scop.) DC.
Physcia isidiigera (Zahlbr.) Fink = *Physcia pulverlenta* (Schreb.) Hampe var. *isidiigera* Zahlbr.
Physcia lithotea (Ach.) Nyl. = *Physcia sciastra* (Ach.) Du Rietz
Physcia louisianae B. de Lesd. = a *nomen ambiguum*
Physcia melops Duf. = *Physcia phaea* (Tuck.) Thomson
Physcia obscura (Ehrh.) Hampe = *Physcia ciliata* (Hoffm.) Du Rietz
Physcia obsessa (Mont.) Ach. = *Physcia alba* (Fée) Müll. Arg. var. *obsessa* (Mont.) Thomson
Physcia tribacia auct. *pro parte* = *Physcia millegrana* Degelius
Physcia venusta (Ach.) Nyl. = *Physcia pulverulenta* (Schreb.) Hampe var. *venusta* (Ach.) Nyl.
Pilophoron fibula (Tuck.) Th. Fr. = *Pilophoron cereolus* (Ach.) Nyl.
Psora spp. = Lecidea (sect. Psora) spp.
Psora ostreata Hoffm. = *Lecidea scalaris* Ach.
Psorotichia schaereri (Mass.) Arn. = *Pyrenopsis schaereri* (Mass.) Nyl.
Pterygium petersii Nyl. = *Placynthium petersii* (Nyl.) Burnh.

Pyrenula farrea (Ach.) Branth. & Rostr. = *Pyrenula leucoplaca* (Wallr.) Körber
Pyrenula laevigata (Pers.) Arn. = *Pyrenula glabrata* (Ach.) Mass.
Pyrenulelia endococcoidea (Nyl.) Fink = a fungus
Pyrothamnia spp. = *Endocarpon* spp.
Pyrothamnia brandegei (Tuck.) Zahlbr. = *Endocarpon pulvinatum* Th. Fr.
Pyxine frostii Tuck. = *Physcia frostii* (Tuck.) Zahlbr..
Pyxine meissneri Tuck. = *Pyxine berteriana* (Fée) Imshaug
Pyxine picta (Sw.) Tuck. = *Physcia picta* (Sw.) Nyl.
Ramalina pollinariella Nyl. = *Ramalina roesleri* (Hochst.) Nyl.
Ramalina yemensis (Ach.) Nyl. = *Ramalina ecklonii* (Spreng.) Mey. & Flot.
Rhizocarpon alboatrum (Hoffm.) Anzi = *Buellia alboatra* (Hoffm.) Th. Fr.
Rhizocarpon alpicolum (Wg.) Rabenh. = *Rhizocarpon oreites* (Vain.) Zopf
Rhizocarpon ambiguum (Schaer.) Zahlbr. = *Rhizocarpon distinctum* Th. Fr.
Rhizocarpon concretum (Ach.) Elenk. = *Rhizocarpon geminatum* (Flot.) Körber
Rhizocarpon occidentale Lynge = *Rhizocarpon superficiale* (Schaer.) Vain.
Rhizocarpon oidaleum (Tuck.) Fink = *Buellia oidalea* Tuck.
Rhizocarpon penichrum (Tuck.) Merr. = *Buellia penichra* (Tuck.) Hasse
Rhizocarpon petraeum (Wulf.) Mass. = *Rhizocarpon grande* (Flörke) Arn.
Rhizocarpon polare Räs. = *Rhizocarpon superficiale* (Schaer.) Vain.
Rinodina orbata (Ach.) Vain. = *Rinodina turfacea* Körber
Rinodina phaeocarpa (Sommerf.) Vain. = *Rinodina nimbosa* (Fr.) Th. Fr.
Rinodina sabulosa Tuck. = *Rinodina intermedia* Bagl.
Rinodina sophodes auct. (North American records) = misidentifications
Rinodina thomae Tuck. = *Buellia glaziouana* (Krempelh.) Müll. Arg.
Schismatomma abietinum (Ehrh.) Mass. = *Lecanactis abietina* (Ehrh.) Körber
Secoliga carneoluta auct. = *Gyalecta carneolutea* (Turn.) Oliv.
Secoliga geoica (Wahlb.) Körber = *Gyalecta geoica* (Wahlb.) Ach.
Solorinaria despreauxii (Mont.) Fink = *Heppia lutosa* (Ach.) Nyl.
Speerschneidera euploca (Tuck.) Trev. = *Teloschistes euplocus* (Tuck.) Zahlbr.
Sphinctrina microcephala (Sm.) Nyl. = *Calicium microcephalum* (Sm.) Ach.
Stereocaulon capitellatum auct. (North American records) = misidentifications
Stereocaulon coralloides Fr. = *Stereocaulon dactylophyllum* Flörke
Stereocaulon denudatum Flörke = *Stereocaulon vesuvianum* Pers. var. *denudatum* (Flörke) Lamb
Stereocaulon pseudoarbuscula auct. (North American records) = *Stereocaulon subalbicans* Lamb
Stereocaulon quisquilare Nyl. = *Stereocaulon microscopicum* (Vill.) Frey
Sticta amplissima auct., in our area = *Lobaria quercizans* Michx.
Sticta aurata Ach. = *Pseudocyphellaria aurata* (Ach.) Vain.
Sticta crocata (L.) Ach. = *Pseudocyphellaria crocata* (L.) Vain.
Sticta crosa (Eschw.) Tuck. = *Lobaria crosa* (Eschw.) Nyl.
Sticta hallii Tuck. = *Lobaria hallii* (Tuck.) Zahlbr.
Sticta herbacea (Huds.) Ach. = *Lobaria lactevirens* (Lightf.) Zahlbr.
Sticta linita Ach. = *Lobaria linita* (Ach.) Rabenh.
Sticta oregana Tuck. = *Lobaria oregana* (Tuck.) Müll. Arg.
Sticta pulmonaria (L.) Bir. = *Lobaria pulmonaria* (L.) Hoffm.

Sticta quercizans Ach. = *Lobaria quercizans* Michx.
Sticta verrucosa (Huds.) Fink = *Lobaria scrobiculata* (Scop.) DC.
Synechoblastus spp. = *Collema* spp.
Synechoblastus aggregatus ("Ach.") Th. Fr. = *Collema fasciculare* (L.) G. H. Web.
Synechoblastus polycarpus (Hoffm.) D. T. & S. = *Collema polycarpon* Hoffm.
Synechoblastus pycnocarpus Nyl. = *Collema conglomeratum* Hoffm. var. *crassiusculum* (Malme) Degelius
Synechoblastus rupestris (Sw.) Trev. = *Collema flaccidum* (Ach.) Ach.
Synechoblastus texanus (Tuck.) Müll. Arg. = (?) *Collema conglomeratum* Hoffm. var. *crassiusculum* (Malme) Degelius
Teloschistes candelarius (L.) Fink = *Xanthoria candelaria* (L.) Arn.
Teloschistes candelarius auct. (North American records) = *Xanthoria candelaria* (L.) Arn. or *Xanthoria fallax* (Hepp) Arn.
Teloschistes parietinus (L.) Norm. = *Xanthoria parietina* (L.) Th. Fr.
Teloschistes polycarpus (Ehrh.) Tuck. = *Xanthoria polycarpa* (Ehrh.) Rieb.
Teloschistes ramulosus Tuck. = *Xanthoria ramulosa* (Tuck.) Herre
Thelidiella blastenicola Fink = a fungus
Thelocarpon epilithellum Nyl. = *Thelocarpon laureri* (Flot.) Nyl.
Thelocarpon prasinellum Nyl. = *Thelocarpon laureri* (Flot.) Nyl.
Thyrea demangeonii (Moug.) Fink = *Phylliscum demangeonii* (Moug.) Nyl.
Thyrea pulvinata (Schaer.) Mass. = *Pyrenopsis pulvinata* (Schaer.) Th. Fr.
Tomasellia esenbeckiana (Fée) Müll. Arg. = *Melanotheca esenbeckiana* Fée
Toninia squarrosa (Ach.) Th. Fr. = *Toninia squalida* (Schleich.) Mass.
Umbilicaria coriacea Imshaug = *Agyrophora rigida* (Du Rietz) Llano
Umbilicaria pensylvanica Hoffm. = *Lasallia pensylvanica* (Hoffm.) Llano
Umbilicaria pustulata auct. (most North American records) = *Lasallia papulosa* (Ach.) Llano
Umbilicaria rigida (Du Rietz) Frey = *Agyrophora rigida* (Du Rietz) Llano
Umbilicaria semitensis Tuck. = *Umbilicaria angulata* Tuck.
Urceolaria actinostoma Pers. = *Diploschistes actinostomus* (Pers.) Zahlbr.
Urceolaria albissima (Ach.) Fink = *Diploschistes albissimus* (Ach.) D. T. & S.
Urceolaria scruposa (Schreb.) Ach. = *Diploschistes scruposus* (Schreb.) Norm.
Usnea barbata auct. (North American records) = misidentifications
Usnea diplotypus Vain. (North American records) = misidentifications
Usnea plicata auct. (North American records) = misidentifications
Verrucaria iowensis Servít = *Verrucaria fayettensis* Servít
Verrucaria submersa Schaer. = *Verrucaria submersella* Servít

ENZYMES OF HEPATICAE. III.* RIBONUCLEASE IN RICCIA DISCOLOR[1]

RAM UDAR[2] and SATISH CHANDRA[3]

Nucleases or nucleodepolymerases (Laskowski, 1951) are widely held to play an important role in the metabolism of nucleic acids. They are generally believed to degrade macro-molecular nucleic acids into smaller components or conversely to rearrange these into nucleic acids or polynucleotide fragments.

The enzyme ribonuclease (RNase) that depolymerises ribonucleic acid (RNA) into oligo- or mononucleotides without the liberation of free phosphoric acids is widely distributed in the leaves, shoots and seeds of plants (Jono, 1930a; Schlamowitz & Garner, 1946; Bhimeswar & Sreenivasaya, 1950, 1953; Holden & Pirie, 1955a; Bernheimer & Steele, 1955; Pierpoint, 1956; Niggemeyer & Reddi, 1957; Shuster, 1957, and others). With the increasing importance attached in recent years to this enzyme in metabolism, it was considered desirable to study it in the Hepaticae, which have not received any attention so far on such studies. The present communication is an attempt to initiate investigation on this aspect in the liverworts and deals with the characterization of certain properties of the enzyme ribonuclease in fresh aqueous extracts of male and female plants of *Riccia discolor* L. & L.

The male and female plants of *Riccia discolor,* used in these experiments, were selected because they were available in abundance locally and in a preliminary investigation earlier (Udar & Chandra, 1960) exhibited appreciable ribonuclease activity. Besides, the compact nature of the thalli was of great help in effectively cleaning them.

Enzyme extract: Plants collected from the same habitat were washed thoroughly with tap water, and those falling under rigid standardization selected. Portions of these thalli cut from the

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apical region (4-5 mm.) were washed several times with glass-distilled water, dried for surface moisture in folds of blotting paper, weighed, and chilled in deep-freeze at —20° C. Enzyme extract was prepared by grinding the chilled material in a pre-cooled pestle until a smooth paste was obtained. This was diluted to 20 ml./gm. fresh weight of the material with glass-distilled water, and the solution centrifuged (10,000 r.p.m. at —5° C. in a refrigerated centrifuge for 15 minutes). The supernatant was held at 4° C. and used directly for the assay of the enzyme activity within a few hours.

Reagents: The substrate, yeast RNA (Dios Chem. Inc.), was made into a solution containing 4 mg./ml. in Veronal buffer of pH. 7.0. MacFadyen's reagent was prepared by dissolving uranium acetate (A.C.S.) in 5% trichloracetic acid (E.M.) to give a solution of 0.25% (MacFadyen, 1934). Orcinol reagent stock was prepared by dissolving 13.5 gm. of ferric ammonium sulphate (A.R.) and 20 gm. of orcinol (B.D.H.) in 500 ml. of distilled water. When in use 25 ml. of this stock solution was added to 415 ml. of concentrated hydrochloric acid (A.R.) and diluted to 500 ml. with distilled water.

Estimation of the enzyme activity: Measurement of the enzyme activity was carried out by a modification of the method described by MacDonald (1955). The reaction mixture consisted of 0.5 ml. Veronal buffer of pH. 7.0, 0.25 ml. of neutral RNA solution (4mg./ml.) and 0.25 ml. of enzyme extract. This was incubated at 37° C. for 2 hours. At the end of the incubation time the reaction was stopped by adding 1 ml. of MacFadyen's reagent which precipitated the proteins and undecomposed nucleic acid while nucleotides and smaller units remained in solution. The tubes were left overnight in the cold and the contents subsequently centrifuged next morning at 3000 r.p.m. for 10 minutes. 1 ml. aliquot of the supernatant was analyzed for total pentose by Brown's Orcinol reaction (Brown, 1946), and the color developed was read in a Klett Summerson photo-electric colorimeter using a red filter (660 mμ). Controls were run side by side where the enzyme extract was added after the addition of the MacFadyen's reagent. The amount of RNA solubilized, corresponding to the difference between the readings of the control and test, was determined from a standard curve prepared by data obtained from known amounts of RNA, and the ribonuclease activity was always expressed in terms of the micrograms of RNA solubilized.

Results

Ribonuclease activity of Riccia discolor male and female plants: The estimation of ribonuclease activity in the extract of two plants as determined by the method described above is given in table 1.

Table 1. *RNase activity of the ♂ and ♀ plants of Riccia discolor.*

Plants	Micrograms of RNA solubilized
Riccia discolor ♂	54
Riccia discolor ♀	46

From a comparison of the amount of RNA solubilized the male plant was found to have more activity.

Factors effecting RNase activity of the extract: The effect of pH, substrate concentration, enzyme extract concentration, incubation time, heat inactivation of the enzyme extract, metal ions, metal binders, and certain chemicals on the RNase activity of the extract was studied. In these experiments, whereas the technique for measuring the activity in each case was similar to the one already described, the reaction mixture and the mode of running the reaction were modified. The methods adopted for each investigation being different are given at appropriate places in the text.

Effect of pH: The reaction mixture in these experiments consisted of 0.25 ml. of aqueous enzyme extract, 0.25 ml. of neutral RNA solution and 0.5 ml. Veronal buffer of different pH. The RNase activity of the extract at different pH is given in figure 1. Optimum pH of both the plants was found to be 7.0 where the curve showed a sharp peak. In either case the activity decreased on each side of this value.

Effect of enzyme extract concentration: For these investigations the enzyme extract was prepared in Veronal buffer of pH 7.0. The reaction mixture was modified to contain varied concentrations of the enzyme extract, 0.25 ml. of neutral RNA solution, and different quantities of Veronal buffer of pH 7.0 to adjust the total volume of the reaction mixture to 1 ml. The amount of RNA solubilized in each case was estimated; the result is given in figure 2. With the increasing concentration of the enzyme extract, the activity was found to increase constantly in both the plants. The rate of activity, however, was proportional only up to 0.25 ml. in each plant, after which it gradually slowed down.

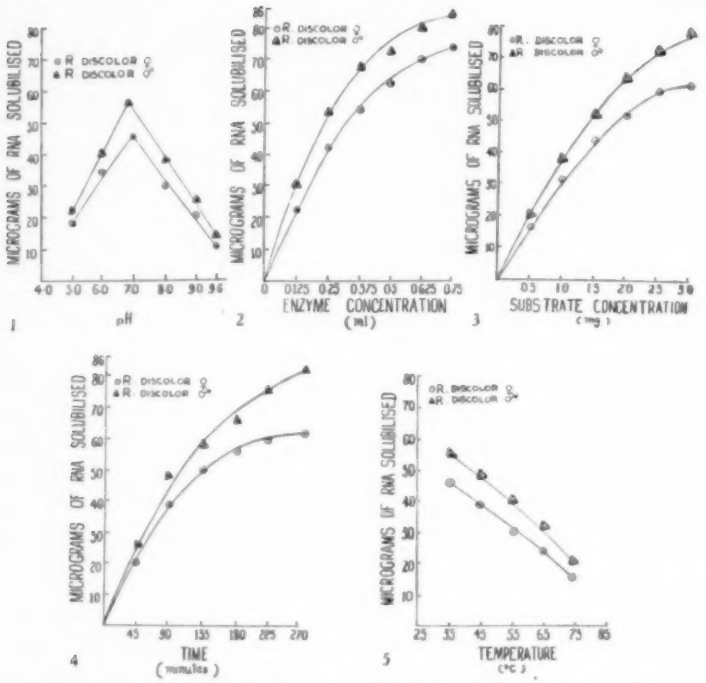

FIG. 1. Effect of pH on the RNase activity of the extracts. FIG. 2. Effect of enzyme concentration on the RNase activity of the extracts. FIG. 3. Effect of substrate concentration on the RNase activity of the extracts. FIG. 4. Effect of incubation time on the RNase activity of the extracts. FIG. 5. Effect of heat on the inactivation of the RNase activity of extracts.

Effect of substrate concentration: Besides varied concentrations of the substrate, the reaction mixture contained 0.25 ml. of the enzyme extract and different quantities of Veronal buffer of pH 7.0 to give the final volume of 1 ml. in the reaction mixture. Measurements of the activity at different concentrations are given in figure 3. In either plant at substrate concentrations up to 1 mg. the amount of RNA solubilized was proportional to the concentration. After this, there was no proportionality, although there was an increase in the rate of the activity.

Effect of incubation time: This was studied by running the usual reaction as described for the estimation of the enzyme activity, excepting that the reaction was stopped after different incubation periods. The result is given in figure 4. The rate of activity was

found proportional to the reaction time up to 90 minutes in either plant after which, although the activity increased, its rate slowed down.

Effect of heat on the enzyme extract: In these experiments a mixture containing 0.25 ml. of enzyme extract and 0.5 ml. of Veronal buffer of pH 7.0 was first heated in a water bath at different temperatures for 10 minutes. After this 0.25 ml. of neutral RNA solution was added and the ribonuclease activity determined after 2 hours of incubation at 37° C. The result is given in figure 5. For both the plants it was observed that the activity decreased with the increase in temperature. However, the activity, though suppressed, did not completely stop even in those cases where the extract was kept at 75° C.

Effect of metal ions and other chemicals on the ribonuclease activity of the extract: An attempt was made to study the effect of metal ions, metal binders, and hydrazine sulphate on the ribonuclease activity of the extract. The substances to be tested were dissolved in Veronal buffer of pH 7.0 to give a concentration of M/500, and 0.5 ml. of this solution was taken in the reaction mixture in place of the buffer. In these experiments a mixture of 0.25 ml. of enzyme extract and 0.5 ml. buffered solution of the substance to be tested was first incubated at 37° C. for 1 hour, and then the reaction was started by adding 0.25 ml. of the substrate. Controls were run on the pattern of the usual test as described above. The result is given in table 2. All the substances were found to inhibit the ribonuclease activity of the enzyme extract. Among the metal ions Mn^{++}, Co^{++}, and Ca^{++} and among the

TABLE 2. *Effect of certain metals, metal binders, and hydrazine sulphate on the RNase activity of the extract.*

No.	Inhibitor	% INHIBITION	
		Riccia discolor ♂	*Riccia discolor* ♀
1.	Hydrazine sulphate	13	14
2.	O-phenanthroline	86	85
3.	E.D T.A.	52	41
4.	8-OH quinoline	76	79
5.	$\alpha\ \alpha'$-dipyridyl	53	36
6.	Ca^{++}	97	81
7.	Mn^{++}	100	93
8.	Cu^{++}	68	65
9.	Hg^{++}	55	34
10.	Mg^{++}	57	36
11.	Co^{++}	100	70

metal binders o-phenanthroline and 8-OH quinoline brought about maximum inhibition of the ribonuclease activity in both the plants.

Conclusion

The results indicate that the ribonuclease activity is present in the fresh aqueous extracts of the male and female plants of *Riccia discolor*. Within limits of the experimental conditions the data, that have been presented on a fresh weight basis, show parallel activity in both the plants. The male plant, however, has more activity.

The kinetic studies of the enzyme extract reveal the following observations: (1) the activity of the enzyme extract is effected by pH, incubation time, substrate concentration, enzyme extract concentration, and heat; (2) the optimum pH is 7.0, and an increase or decrease in pH unit results in a sharp decline of the ribonuclease activity; (3) an increase in the incubation time, substrate concentration, or enzyme extract concentration results in a proportional increase in the amount of RNA solubilized to a certain extent after which it falls down; (4) heat inactivates the enzyme extract slowly with the increasing temperature, but even temperatures up to 75° C. do not inactivate the enzyme completely at pH 7.0.

The effect on the enzyme extract of various metal ions, metal binders, and hydrazine sulphate has been observed to be inhibitory. Maximum inhibition was found by metal ions Mn^{++}, Co^{++} and Ca^{++} and metal binders O-phenanthroline and 8-OH quinoline.

The present investigation clearly shows that study of ribonuclease activity in the Hepaticae can be taken up satisfactorily. It may also be stressed that extended studies in the numerous genera of this group distributed abundantly in nature and so far without any apparent economic significance might afford an excellent source for the extraction of the RNA or its components.

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TAXONOMIC NOTES. XV. THE RECIPROCAL HYBRID OF DITRICHUM–PLEURIDIUM

A. LEROY ANDREWS[1]

Recently[2] Dr. F. J. Hermann and the present author described a natural hybrid sporophyte between *Pleuridium subulatum* (*alternifolium*) ♀ and *Ditrichum pallidum* ♂ found by Hermann at Beltsville, Maryland. I had some hope that renewed search might reveal the reciprocal hybrid, and on April 30, 1960 Hermann found limited material of what he, apparently correctly, took to be this hybrid. As he was on the eve of an extended trip to European herbaria for other research, he turned over his material to me for whatever disposal I cared to make of it. It is my intention to call attention briefly to its existence and its relation to the similar European hybrid.[3]

[1] 409 Mitchell St., Ithaca, N. Y.

[2] The Bryologist 62: 119ff. 1959.

[3] For convenience of reference the previously described hybrid will be designated hybrid 1, the present one hybrid 2.

The material consists of two small tufts of mostly *Pleuridium alternifolium* (*subulatum* of Grout's *Flora*) with mature or nearly mature sporophytes, mostly showing the brown color. Intermingled are a considerable number of plants of *Ditrichum pallidum* with sporophytes showing long setae (1.5 to 3 cm.) but entirely immature, mostly simple spears with capsules not yet swollen or at most green and slightly swollen with operculum showing. The supposedly hybrid sporophytes, 5 in number, were on *Ditrichum* gametophytes in close proximity to normal *Ditrichum* plants and were essentially or nearly mature, showing brown color and brown spores. Though in the dry material the capsules are not erect, the seta being weak and only half the diameter of that of hybrid 1 (about 85 μ compared with 175 μ), when thoroughly soaked out the seta is straight and the capsule practically erect, varying at most by a very slight angle from the vertical. The seta is not more than 4 mm. in length, barely elevating the capsule above the leaves. The capsule itself is of a shining, yellowish-brown color, subcylindrical, about 2.5 mm. long over all, with a rather long, slightly curved opercular part, which however is not sharply set off from the rest of the capsule and not functioning as an operculum; attempts to separate it along a definite line were unavailing. There is no evidence of annulus or peristome. The capsule has a definite short neck like its *Ditrichum* parent, containing the stomata. The fully developed spores reach 25 μ, are brown and warty, but are accompanied by numerous much smaller, apparently imperfect ones. All of these features show such striking resemblance to the figure and detailed description of Limpricht's[4] *Ditrichum astomoides* that close relationship cannot be doubted. According to Breidler, who discovered it, the latter was a hybrid between *Ditrichum pallidum* ♀ and *Pleuridium subulatum* (*acuminatum* of Grout's *Flora*) ♂. The seta of our plant is slightly longer than that of the European, the capsule also. Otherwise there seems no difference, and the two Pleuridiums involved are of course very closely related. Dr. Hermann informs me that he was able to make one more trip to the hybrid locality after a rain and found two more of the hybrid 2 sporophytes, which he deposited in the U. S. National Herbarium. Strangely enough, hybrid 1 appeared not to be developing well the present year (1960); a single imperfect specimen was detected by Hermann. All of his material of both hybrids, he informs me, was found in a very limited area of at most a few square feet and the existence of the mosses is already threatened by the spread of higher weedy plants.

[4] Laubmoose 1: 511. 1887.

That the hybrid sporophyte in the case of reciprocal moss hybrids tends to resemble more closely the ♀ parent is confirmed also by Wettstein's experiments and may seem only natural as it grows upon and takes its nourishment from this parent. Wettstein[5] employed this fact to support his contention that the cytoplasm plays a role in inheritance no leses than the nuclear genes.

[5] See especially Bibliotheca Genetica 10: 193ff. 1928.

LICHENS OF ARCTIC AMERICA. IV. LICHENS COLLECTED MAINLY BY A. INNES-TAYLOR IN GREENLAND AND THE CANADIAN ARCHIPELAGO

JOHN W. THOMSON[1]

Records of lichens of the Canadian Arctic Archipelago have been mainly concerned with collections from Ellesmere Island and Baffin Island. Rarely have collections been brought back from the farther islands of the archipelago. Phytogeographically this distant and most inaccessable series of islands is exceedingly interesting, and it is with eagerness that one looks forward to the study of material from so remote a region. The opportunity to work on such a collection came through the courtesy of a loan from the National Museum of Canada. For the loan of this series of lichens collected by Alan Innes-Taylor in the vicinity of Thule, Greenland, and on several islands of the archipelago, I am much indebted to Dr. Howard Crum.

The lichens were gathered while Alan Innes-Taylor was a member of a Canadian-United States weather station group during the summers of 1947 and 1948. Innes-Taylor's experiences and reactions to the solitudes of the far north are briefly noted in an article in *Arctic* (1948). Innes-Taylor gathered few of the large lichens which most Arctic travelers bring home but principally a fine series of crustose specimens. And as is so often the case, growing with the crustose species for which a rock was picked up, were many less conspicuous associates which add materially to the record. The effort to bring back some of the crustose lichens reaped a harvest of new records for the region which makes the list of Innes-Taylor's collections a very worthwhile contribution to the growing information on the American Arctic.

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The full set of specimens on which this report is based is kept at the National Museum of Canada. To save repetition, the locality and other information are described below and shortened thereafter in the list. A few additional collections by other arctic specialists have been included in this listing; the collector is cited in each case, Innes-Taylor being abbreviated to Taylor.

List of Localities

Axel Heiberg Island: Diana L. at the head of Mokka Fjord, 79°30′ N., 88°30′ W., on stoney slope, Aug. 1-8, 1953, *A. E. Porsild.*

Baffin Island: Dutch Polar Station, Kungovik Fjord, W. side of island, Aug. 3, 1924, *J. Dewey Soper.* Blue Goose Prairie, W. side of island, 65°30′ N., 73°30′ W., July 18, 1929, *J. Dewey Soper.* Blacklead Island, Cumberland Sound, 65° N., 66°14′ W., Aug. 23, 1924, *J. Dewey Soper.* Pangnirtung Fjord, 66°20′ N., 65° 30′ to 66° W., July 26, 1924, *J. Dewey Soper.*

Bathurst Island: NE. shore of Peddie Bay, 73°13′ N., 100°42′ W., Aug. 27, 1947, *A. Innes-Taylor.* S. shore of Freeman's Cove, 0-150 ft. elev. and within ½ mile of shore, 74°03′ N., 98°05′ W., August 24, 1947, *A. Innes-Taylor.* N. shore of Freeman's Cove, 75°05′ N., 98°00′ W., Aug. 23, 1947, *A. Innes-Taylor.*

Cornwallis Island: Allen Bay, Eskimo camp, 74°44′ N., 94°55′ W., 100 ft. elev., Sept. 2, 1947, *A. Innes-Taylor.* Cape Martyr, 74°41′ N., 94°50′ W., Eskimo tent rings, 25 ft. elev., Sept. 2, 1947, *A. Innes-Taylor.* East Hills, Resolute Bay, 74°47′ N., 94°40′ W., Sept. 6, 1947, *A. Innes-Taylor.* E. shore of Resolute Bay, 74°43′ N., 94°34′ W., Aug. 21, 1947, *A. Innes-Taylor.* W. shore of Resolute Bay, 74°43′ N., 94°45′ W., Sept. 1, 1947, *A. Innes-Taylor.* Resolute Bay, near airstrip, 74°45′ N., 94°50′ W., alt. 200 ft., Sept. 2, 1947, *A. Innes-Taylor.* S. side of Resolute Bay, 74°45′ N., 94°44′ W., alt. 120 ft., from dried pond bottom, Sept. 8, 1947, *A. Innes-Taylor.*

Devon Island: Dundas Harbour, 74°31′ N., 82°25′ W., July 28, 1947, *A. Innes-Taylor.* E. shore of Erebus Bay, 74°43′ N., 91°42′ W., Aug. 29, 1947, *A. Innes-Taylor.*

Ellef Ringnes Island: Isachsen Station at NW. tip of island, 78°47′ N., 103° 33′ W., July 1948, *A. Innes-Taylor;* also *W. W. Heywood,* 1953.

Ellesmere Island: Goose Fjord in SW. part of island, 77° N., 88° W., 0-100 ft. elev., Aug. 11, 1947, *A. Innes-Taylor;* also *Hanley,* Aug. 12, 1947. Slidre Bay, W. side of island, Eureka, 80°01′ N., 85°25′ W., above 450 ft. alt., Aug. 9, 1947, *A. Innes-Taylor.*

Greenland: Thule, 76°33′ N., 68°45′ W., on valley floor at elev. 100-300 ft., July 24, 1947, *A. Innes-Taylor.*

Ward Hunt Island: 85°05′ N., 75°30′ W., July 15-20, 1954, *J. Hattersley-Smith.*

The present paper lists 81 species of lichens (including 88 taxa) and also two lichen parasites. The lichens reported from each of the islands visited are as follows: Axel Heiberg Island, 3 species; Baffin Island, 7 species; Bathurst Island, 33 species;

Cornwallis Island, 34 species; Devon Island, 8 species; Ellef Ringnes Island, 9 species; Ellesmere Island, 20 species; Thule, Greenland, 9 species; and Ward Hunt Island, 2 species. The majority of these reports are new for their respective islands except for those from Greenland which through the work of the late Bernt Lynge and his students is far better known than the islands. Even those from Ellesmere Island represent the first reports from the little known west coast. One species, *Ionaspis schismatopsis* var. *lyngei* is new to North America.

Verrucaria arctica Lynge. BATHURST IS.: S. shore of Freeman's Cove, *Taylor* 50 (with *Ionaspis schismatopsis* and *Lecidea elata*).

Polyblastia hyperborea T. Fr. BATHURST IS.: S. shore of Freeman's Cove, *Taylor* 53 (var. *nuda* T. Fr.), 58 (with *Lecanora dispersa*), 60 (with *Lecidea elata*); N. shore of Freeman's Cove, *Taylor* 149 (with *Lecidea atromarginata*).

Polyblastia integrascens Vain. BATHURST IS.: S. shore of Freeman's Cove, *Taylor* 56.

Polyblastia theleodes (Somerf.) T. Fr. BATHURST IS.: S. shore of Freeman's Cove, *Taylor* 52, 54.

Pyrenopsis pulvinata (Schaer.) Hellb. ELLESMERE IS.: Goose Fjord, *Hanley* 69.

Placynthium asprellum (Ach.) Trev. BATHURST IS.: S. shore of Freeman's Cove, *Taylor* 65.

Ionaspis schismatopsis var. *lyngei* H. Magn. BATHURST IS.: S. shore of Freeman's Cove, *Taylor* 50 (with *Lecidea elata*). CORNWALLIS IS.: S. side of Resolute Bay, from dried pond bottom, *Taylor* 19. This species grew on calcareous rocks which effervesce readily with acid. The thallus is clay-colored and rimose-areolate, the apothecia concave and black. The section of the apothecium is very colorful, with a blue upper hymenium and a yellow subhymenium. The blue part of the hymenium turns a beautiful violet with dilute nitric acid. The spores are 8 × 14 μ. According to Magnusson's monograph (1933), this species has not hitherto been reported from North America.

Lecidea acrocyanea (T. Fr.) H. Magn. CORNWALLIS IS.: W. shore of Resolute Bay, *Taylor* 86 (with *Caloplaca elegans*). ELLESMERE IS.: Slidre Bay, *Taylor* 1.

Lecidea atrobrunnea (Ram.) Schaer. BATHURST IS.: NE. shore of Peddie Bay, *Taylor* 131.

Lecidea atromarginata H. Magn. BATHURST IS.: N. shore of Freeman's Cove, *Taylor* 144, 149 (with *Polyblastia hyperborea*); S. shore of Freeman's Cove, *Taylor* 49. CORNWALLIS IS.: W. shore of Resolute Bay, *Taylor* 92; Resolute Bay near airstrip, *Taylor* 116; Cape Martyr, S. side of island, Eskimo tent rings, *Taylor* 110. ELLESMERE IS.: Goose Fjord, *Taylor* 76, 79 (with *Rhizocarpon tinei*). WARD HUNT ISLAND: *Hattersley-Smith* 13.

Lecidea auriculata T. Fr. CORNWALLIS IS.: W. shore of Resolute Bay, *Taylor* 93. Var. *diducens* (Nyl.) Fr. CORNWALLIS IS.: E. shore of Resolute Bay, *Taylor* 98. BATHURST IS.: NE. shore of Peddie Bay, *Taylor* 40. Var. *paupera* T. Fr. ELLESMERE IS.: Goose Fjord, *Taylor* 74.

Lecidea asukensis Lynge. ELLESMERE IS.: Goose Fjord, *Taylor* 78

(with *Sporostatia testudinea, Caloplaca elegans, Rhizocarpon superficiale* ssp. *boreale,* and *Lecanora candida*).

Lecidea confluens E. Fr. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* 105.

Lecidea despecta T. Fr. BATHURST Is.: N. shore of Freeman's Cove, *Taylor* 142, 155. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 121; E. shore of Resolute Bay, *Taylor* 102 (with *Protoblastenia rupestris*); Resolute Bay, near airstrip, *Taylor* 114.

Lecidea dicksonii (Gmel.) Ach. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 34, 36, 134 (all with *Lecanora cladonioides*), 35, 45 (with *Sporostatia testudinea* and *Rhizocarpon superficiale* ssp. *boreale*).

Lecidea elata Schaer. BATHURST Is.: N. shore of Freeman's Cove *Taylor* 137, 145 (parasitized by *Tichothecium pygmaeum*). CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 91.

Lecidea goniophila Flk. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 89. ELLESMERE Is.: Goose Fjord, *Taylor* 82.

Lecidea lapicida Ach. BATHURST Is.: N. shore of Freeman's Cove, *Taylor* 146, 147, 148. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 18; S. side of Resolute Bay, *Taylor* 21; East Hills, Resolute Bay, *Taylor* 129. ELLEF RINGNES Is.: ISACHSEN STATION, *Heywood* 39. ELLESMERE Is.: Goose Fjord, *Taylor* 72, 80. Fo. *ecrustacea* (Bausch) Anzi. CORNWALLIS Is.: Cape Martyr, Eskimo tent rings, *Taylor* 117. Fo. *ochracea* (Nyl.) Vain. BATHURST Is.: N. shore of Freeman's Cove, *Taylor* 144 (with *Lecidea atromarginata*). ELLESMERE Is.: Slidre Bay, *Taylor* 7.

Lecidea lulensis (Hellb.) T. Fr. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 45 (with *Sporostatia testudinea, Lecidea dicksonii,* and *Rhizocarpon superficiale* ssp. *boreale*); S. shore of Freeman's Cove, *Taylor* 48 (with *Lecanora polytropa*). CORNWALLIS Is.: Allen Bay, Eskimo camp, *Taylor* 120; E. shore of Resolute Bay, *Taylor* 104 (with *Lecanora atrosulphurea*).

Lecidea micacea Kbr. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 33.

Lecidea occidentalis Lynge. CORNWALLIS Is.: Resolute Bay, near airstrip, *Taylor* 115 (a sterile specimen; identification uncertain).

Lecidea pungens (Körb.) Nyl. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 86 (with *Caloplaca elegans, Buellia vilis, Lecanora dispersa, Candelariella aurella,* and *Sarcogyne simplex* fo. *complicata*).

Lecidea stigmatea Ach. AXEL HEIBERG Is.: Diana L., head of Mokka Fjord, *Porsild* 18594. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 95 (with *Physcia dubia, Caloplaca elegans, Candelariella aurella,* and *Lecanora dispersa*). ELLEF RINGNES Is.: Isachsen Station, *Heywood* 26.

Lecidea trochodes Tayl. ELLESMERE Is.: Slidre Bay, *Taylor* 8 (determination not quite certain because of lack of comparison material).

Lecidea vorticosa (Flk.) Koerb. CORNWALLIS Is.: Allen Bay, Eskimo camp, *Taylor* 119 (with *Protoblastenia rupestris*). The apothecia are tiny for this species and more sessile; the hypothecium is blue, and the exciple violet and radiating; the spores 6-7 × 12-14 μ.

Rhizocarpon intermediellum Räs. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 94.

Rhizocarpon subtile Runem. ELLESMERE Is.: Slidre Bay, *Taylor* 15. (parasitic on *Lecidea dicksonii,* as is the type from SW. Greenland, the only previously known collection according to Runemark, 1956).

Rhizocarpon superficiale ssp. *boreale* Runem. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 45 (with *Sporostatia testudinea* and *Lecidea lulensis*), 136; S. shore of Freeman's Cove, *Taylor* 51. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* 22. DEVON Is.: Dundas Harbor, *Taylor* 12 (with *Sporostatia testudinea*), 10 (with *Umbilicaria lyngei*), 11 (with *Parmelia alpicola* and *Alectoria minuscula*). ELLESMERE Is.: Goose Fjord, *Taylor* 78 (with *Sporostatia testudinea, Caloplaca elegans, Lecanora candida,* and *Lecidea asukensis*), 85. GREENLAND: Thule, *Taylor* 29 (with *Sporostatia testudinea*).

Rhizocarpon tinei (Torn.) Runem. ELLESMERE Is.: Goose Fjord, *Taylor* 71, 79 (with *Lecidea atromarginata*). Ssp. *arcticum* Runem. CORNWALLIS Is.: Allen Bay, Eskimo camp, *Taylor* 118; East Hills, Resolute Bay, *Taylor* 127. ELLESMERE Is.: Goose Fjord, *Taylor* 75. Ssp. *frigidum* (Räs.) Runem. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 133.

Umbilicaria arctica (Ach.) Nyl. BAFFIN Is.: W. coast, Camp Kungovik, Blue Goose Prairie, on granite, *Soper* 59b.

Umbilicaria hyperborea (Ach.) Hoffm. GREENLAND: Thule, *Taylor* 30.

Umbilicaria lyngei Schol. DEVON Is.: Dundas Harbor, *Taylor* 10 (with *Rhizocarpon superficiale* ssp. *boreale*).

Umbilicaria proboscidea (L.) Schrad. GREENLAND: Thule, *Taylor* 28 (with *Parmelia alpicola* and *Caloplaca elegans*).

Acarospora veronensis Mass. ELLESMERE Is.: Slidre Bay, *Taylor* 13 (with *Buellia* cf. *stigmatea*). BATHURST Is.: *Taylor* 130.

Sarcogyne simplex fo. *complicata* (Cromb.) H. Magn. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 86 (with *Caloplaca elegans, Buellia vilis, Lecidea pungens, Lecanora dispersa,* and *Candelariella aurella*).

Sporostatia cinerea (Schaer.) Körb. ELLESMERE Is.: Goose Fjord, *Taylor* 77.

Sporostatia testudinea (Ach.) Mass. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 45 (with *Lecidea lulensis, Lecidea dicksonii,* and *Rhizocarpon superficiale* ssp. *boreale*). CORNWALLIS Is.: S. of Resolute Bay, *Taylor* 122. DEVON Is.: Dundas Harbor, *Taylor* 12 (with *Rhizocarpon superficiale* ssp. *boreale*). ELLESMERE Is.: Slidre Bay, *Taylor* 14; Goose Fjord, *Taylor* 83 (with *Lecanora pertusa*), 78 (with *Caloplaca elegans, Rhizocarpon superficiale* ssp. *boreale, Lecanora candida,* and *Lecidea asukensis*). GREENLAND: Thule, *Taylor* 29 (with *Rhizocarpon superficiale* ssp. *boreale*), 32.

Lecanora atrosulphurea (Wahlb.) Ach. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* 104.

Lecanora badia (Pers.) Ach. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 132.

Lecanora campestris var. *septentrionalis* Lynge. ELLESMERE Is.: Goose Fjord, *Taylor* 84.

Lecanora candida (Anzi) Nyl. ELLESMERE Is.: Goose Fjord, *Taylor* 78 (with *Sporostatia testudinea, Caloplaca elegans, Rhizocarpon superficiale* ssp. *boreale,* and *Lecidea asukensis*). Var. *nikrapensis* (Darb.) Zahlbr. BATHURST Is.: N. shore of Freeman's Cove, *Taylor* 138, 140, 143, 150, 151 (parasitized by *Tichothecium pygmaeum*), 152; S. shore of Freeman's Cove, *Taylor* 63. CORNWALLIS Is.: Cape Martyr, Eskimo tent rings, *Taylor* 111. ELLESMERE Is.: Goose Fjord, *Taylor* 68, 81.

Lecanora composita Lynge. BATHURST Is.: N. shore of Freeman's Cove, *Taylor* 141. The spores are rather small (12-14 μ), but otherwise the

specimen agrees well with the species. The composite apothecia are quite marked.

Lecanora cladonioides Lynge. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 36 (with *Lecidea dicksonii*).

Lecanora dendroplaca H. Magn. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 38.

Lecanora dispersa (Pers.) Röhl. BATHURST Is.: N. shore of Freeman's Cove, *Taylor* 139, with *Caloplaca elegans*. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 17, 87 (with *Caloplaca elegans*), 95 (with *Physcia dubia, Caloplaca elegans, Lecidea stigmatea,* and *Candelariella aurella*), 128 (with *Caloplaca elegans* and *Physcia dubia*).

Lecanora flavida Hepp. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 46, 63 (with *Lecanora candida* var. *nikrapensis*).

Lecanora frustulosa var. *occidentalis* Lynge. BAFFIN Is.: Blacklead Is., *Soper* 294.

Lecanora lesleyana (Darb.) Pauls. ELLESMERE Is.: Slidre Bay, *Taylor* 4 (with *Caloplaca elegans*), 5, 9 (corresponding with specimens mentioned by Lynge in *Lichens of Northeast Greenland,* as there is no yellow mist from the exciple in KOH), 16.

Lecanora nathorstii Lynge. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 64 (determination open to question, as the specimen is rather scanty).

Lecanora pertusa Lynge. ELLESMERE Is.: Goose Fjord, *Taylor* 83 (with *Sporostatia cinerea*).

Lecanora polytropa (Ehrh.) Rabh. BAFFIN Is.: Blacklead Is., *Soper* 307a. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 48 (with *Lecidea lulensis*).

Lecanora proserpens Nyl. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* 99 (with *Caloplaca elegans*), 106.

Lecanora subplicigera H. Magn. CORNWALLIS Is.: Resolute Bay near airstrip, *Taylor* 113.

Ochrolechia frigida (Sw.) Lynge. ELLEF RINGNES Is.: Isachsen Station, *Heywood* 23.

Lecania disceptans (Nyl.) Lynge. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 61.

Candelariella aurella (Hoffm.) Zahlbr. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 97 (with *Physcia caesia*), 95 (with *Caloplaca elegans, Physcia dubia, Lecidea stigmatea,* and *Lecanora dispersa*), 86 (with *Buellia vilis, Caloplaca elegans, Sarcogyne simplex* fo. *complicata, Lecidea pungens,* and *Lecanora dispersa*). ELLEF RINGNES Is.: Isachsen Station, *Heywood* 41 (with *Caloplaca festiva*).

Parmelia alpicola T. Fr. BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 42. DEVON Is.: Dundas Harbor, *Taylor* 11 (with *Alectoria minuscula* and *Rhizocarpon superficiale* ssp. *boreale*). GREENLAND: Thule, *Taylor* 28 (with *Umbilicaria proboscidea* and *Caloplaca elegans*).

Parmelia intestiformis (Vill.) Ach. GREENLAND: Thule, *Taylor* 31.

Parmelia omphalodes (L.) Ach. BAFFIN Is.: Dutch Polar Station, Kungovik Fjord, *Soper* 154.

Cetraria islandica (L.) Ach. ELLEF RINGNES Is.: Isachsen Station, *Heywood* 33.

Cetraria nigricascens Elenk. AXEL HEIBERG Is.: Plateau near ice cap, 25 mi. W. of Mokka Fjord, *Porsild* 572.

Alectoria minuscula Nyl. DEVON Is.: Dundas Harbor, *Taylor* 11 (with *Parmelia alpicola* and *Rhizocarpon superficiale* ssp. *boreale*). GREENLAND:

Thule, *Taylor* 24, 27 (with *Umbilicaria lyngei, U. arctica,* and *Lecidea acrocyanea*).

Alectoria nigricans (Ach.) Nyl. BAFFIN Is.: W. coast, Camp Kungovik, Blue Goose Prairie, *Soper* 59c; Blacklead Is., *Soper* 301a. DEVON Is.: Dundas Harbor, *Soper* 295. ELLEF RINGNES Is.: Isachsen Station, *Heywood* 35.

Alectoria pubescens (L.) Howe. ELLEF RINGNES Is.: Isachsen Station, *Taylor* 67.

Alectoria subdivergens Dahl. BAFFIN Is.: Pangnirtung Fjord, *Soper* 74.

Protoblastenia rupestris (Scop.) A. Zahlbr. CORNWALLIS Is.: Allen Bay, Eskimo camp, *Taylor* 119 (with *Lecidea vorticosa*); E. shore of Resolute Bay, *Taylor* 102 (with *Lecidea despecta*).

Caloplaca festiva (Ach.) Zwack. ELLEF RINGNES Is.: Isachsen Station, *Heywood* 41 (with *Candelariella aurella;* det. E. D. Rudolph), *Taylor* 26.

Caloplaca elegans (Link.) T. Fr. AXEL HEIBERG Is.: Diana L., head of Mokka Fjord, common on moist limestone gravel, 3500 ft. elev., *Porsild* 18591 (det. E. D. Rudolph; the specimen forms curious dense cushions of thallus). BATHURST Is.: NE. shore of Peddie Bay, *Taylor* 37, 39, 135; N. shore of Freeman's Cove, *Taylor* 139 (with *Lecanora dispersa*); S. shore of Freeman's Cove, *Taylor* 57 (with *Physcia dubia*). CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 86 (with *Lecidea acrocyanea;* a duplicate grew with *Buellia vilis, Lecidea pungens, Lecanora dispersa, Candelariella aurella,* and *Sarcogyne simplex* fo. *complicata*), 108 (with *Buellia margaritacea* and *Physcia sciastra*), 87 (with *Lecanora dispersa*), 88, 90, 95 (with *Physcia dubia, Lecidea stigmatea, Candelariella aurella,* and *Lecanora dispersa*); E. shore of Resolute Bay, *Taylor* 99 (with *Lecanora proserpens*), 101; East Hills, Resolute Bay, *Taylor* 125, 128 (with *Lecanora dispersa* and *Physcia dubia*) 17 (partly fo. *obliterata*). DEVON Is.: E. shore of Erebus Bay, *Taylor* 123, 124 (with *Rinodona bischoffii*), 126. ELLESMERE Is.: Slidre Bay, *Taylor* 2, 3, 6; Goose Fjord, *Taylor* 70, 78 (with *Sporostatia testudinea, Rhizocarpon superficiale* ssp. *boreale, Lecanora candida,* and *Lecidea asukensis*). GREENLAND: Thule, *Taylor* 27, 28 (with *Umbilicaria proboscidea* and *Parmelia alpicola*). WARD HUNT Is.: *Hattersley-Smith* 3.

Caloplaca murorum T. Fr. GREENLAND: Thule, *Taylor* 25.

Xanthoria fallax (Hepp.) Arn. ELLEF RINGNES Is.: Isachsen Station, *Taylor* 66.

Buellia atrata (Sm.) Anzi. BAFFIN Is.: Blacklead Is., *Soper* 308.

Buellia cf. *stigmatea* Körb.. ELLESMERE Is.: Slidre Bay, *Taylor* 13 (with *Acarospora veronensis*).

Buellia occidentalis Lynge. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* 103. The upper part of the hymenium is violet, becoming more rose-violet in KOH. The hypothecium is dark violet, becoming brown-violet in KOH. The thallus is quite thick, cinereous, becoming areolate, at first continuous, the margin sharp, a hypothallus absent. Spores constricted, 7 × 18 μ.

Buellia margaritacea (Sommerf.) Lynge. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* 108 (with *Physcia sciastra* and *Caloplaca elegans*).

Buellia vilis T. Fr. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 86 (with *Caloplaca elegans, Lecidea pungens, Lecanora dispersa, Sarcogyne simplex* fo. *complicata,* and *Candelariella aurella*).

Rinodina bischoffii (Hepp.) Mass. DEVON Is.: E. shore of Erebus Bay, *Taylor* 124 (with *Caloplaca elegans*).

Physcia caesia (Hoffm.) Hampe. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 55. CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 97 (with *Candelariella aurella*).

Physcia dubia (Hoffm.) Lett. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 57 (with *Caloplaca elegans*). CORNWALLIS Is.: W. shore of Resolute Bay, *Taylor* 96; East Hills, Resolute Bay, *Taylor* 17, 20, 125, 128 (with *Lecanora dispersa and Caloplaca elegans*), 93 (with *Caloplaca elegans, Lecidea stigmatea, Candelariella aurella,* and *Lecanora dispersa*).

Physcia intermedia fo. *wahlenbergii* (Lynge) Thoms. BATHURST Is.: S. shore of Freeman's Cove, *Taylor* 59.

Physcia sciastra (Ach.) DR. CORNWALLIS Is.: E. shore of Resolute Bay, *Taylor* (with *Buellia margaritacea* and *Caloplaca elegans*). ELLEF RINGES Is.: Isachsen Station, *Haywood* 26.

LICHEN PARASITES

Leciographa inspersa Rehm *ex* Rabh. Bathurst Is.: S. shore of Freeman's Cove, *Taylor* 47 (on a *Lecanora*).

Tichothecium pygmaeum Koerb. Bathurst Is.: N. shore of Freeman's Cove, *Taylor* 145 (on *Lecidea elata*), 151 (on *Lecanora candida* var. *nikrapensis*). Cornwallis Island: Resolute Bay, near airstrip, *Taylor* 109 (on a *Lecidea* thallus).

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NOTES ON SOME EXOTIC USNEAS WITH DESCRIPTIONS OF TWO NEW SPECIES

ALBERT W. C. T. HERRE[1]

The Usneas of tropical regions are, in general, very imperfectly known. It is therefore no surprise to find species from the Fiji Islands and from Fernando Po which do not seem to agree with any in the literature. To the descriptions of two such species are appended determinations and notes on some other Usneas from South America, New Guinea, Java, Hawaii, and Africa.

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Usnea fijiensis sp nov.[2] Thallus elongate, pendulous, at least 600 mm. long and an entire adult plant probably close to a meter in length, clear, pale- or straw-yellow in the herbarium, probably straw-green in life, smooth, opaque but almost shiny, subdichotomously and sympodially branched, rather stiff; base not seen; several black haptera observed. Branches uniform, terete, about 1-1.8 mm. in diameter, thallus sometimes rarely branching and without branchlets for long spaces. All branches frequently articulate or subarticulate, irregularly fractured, the joints nearly cylindrical, their tips neither constricted nor margined, the fissures usually narrow but sometimes wide enough to make the joints bead-like, these sometimes slightly misshapen. Here and there on some branches minute, low, concolorous papillae are ± thickly sprinkled; now and then small solitary tubercles are present. Branchlets abundant to very abundant, or again here and there nearly absent, 5-15 mm. long, rarely 20 mm. or more, the more elongate ones rebranching, patent or flexuous, tips perceptibly attenuate and pointed. Branchlets slightly tuberculate or nodulose, becoming slightly deformed here and there. Tips indistinct, disappearing among branchlets. Apothecia not seen. Soredia minute, isidiose, not seen with exactitude, scarce, on tubercles, soon becoming farinose, best developed on branchlets. Cortex about 70 μ. Medulla dense, irregular, now wide, now narrow, average width about 135 μ, bright yellow with K, becoming orange and sometimes turning red. Sections treated with K showed only yellow. Axis solid, with irregular circumference, about 540 μ in diameter, interspersed with many thick, dusky hyphae, mostly in bundles.

The type, an incomplete specimen over half a meter long, was collected on the island of Viti Levu, Fiji Islands (*A. C. Smith*,

[2] Thallus elongatus (fragmentum ca. 600 mm. longum), uniformiter pallidostramineus aut gilvus, glaber, opacus sed fere nitidus, subdichotome et sympodialiter ramosus, potius rigidus; basis non visa; haptera nigra. Rami uniformes, teretes, 1-1.8 mm. crassi, interdum fere non ramosi et sine ramulis; omnes rami saepe articulati aut subarticulati et irregulariter rupti, articulatis fere cylindricis, apicibus non constrictis neque marginatis, fissuris plerumque angustis, teres aut tantum paulo deformatuli; nonnulli rami passim papillis humilis, minutis, concoloribus sparsi. Ramuli sat crebri aut valde crebri, 5-15 mm. longi, rarius 20 mm. aut longiores, patentes aut flexuosi, ad apices sensim attenuati et acuminati; ramuli interdum leviter tuberculati aut nodulosi et leviter deformatuli. Summitates indistinctae, inter ramulos evanescentes. Apothecia non visa. Soredia minutissima, exacte non observata, isidiosa, rare tuberculata, mox farinosa. Cortex ca. 70 μ. Medulla creberrima, irregulares nunc angusta, nunc lata, ca. 135 μ K clare gilva deinde lutea et interdum rubra. Axis ca. 540 μ, ambitu irregularis, solidus, hyphis crassulis et obscuris crebre interstinctis.

1947). It grew in dense masses on trees, at an altitude of 725-825 m. in the northern part of the Rairaimatuku Plateau. (The type is in the herbarium of the New York Botanical Garden, and a fragment is in the author's herbarium.) Evidently a strikingly handsome lichen in life.

Specimens of this *Usnea* have been called *U. intercalaris* Krempelh., a lichen which contrasts strongly in having the cortex about 100 μ thick; the lax medulla becomes deep red with K, and is equal to the axis, each about 300 μ in thickness.

Usnea guineensis sp. nov.[3] Thallus (a fragment) half a meter long, pendulous, very slender, limp; color in life not known; specimen reddish-brown, minor branches and branchlets much paler to yellowish-tan. Base not seen. Main branches very long, smooth, slender, seldom dividing dichotomously, 0.4-0.5 mm. thick, uniform, eventually very gradually attenuate and hairlike, continuous or here and there fractured, the joints close together or ± separate, often white-margined or in part limbiform; secondary branches elongate and hairlike; branchlets very many, mostly 5-10 mm. long, but some up to 30 mm., the longer ones branching, with filamentous tips; branchlets curved or angulate, often jointed or fractured at base. Minor branches and branchlets smooth and polished, but often tuberculate or nodulose, especially toward their extremities, the cylindrical tubercules or nodules often tipped with farinose soralia. Branches not exactly terete but with very low, narrow, ± longitudinal wrinkles or ridges here and there; these sometimes burst open along their tops and bear white farinose soredia. Apothecia not seen. Farinose soralia on minor branches and branchlets and here and there on the wrinkles or ridges. Cortex more or less yellow or red when seen in section. Color more often developed next to the axis but sometimes almost entirely yellow or red, becoming colorless when K is applied; about

[3] Thallus (solum fragmentum) ca. 500 mm. longus, pendulus, valde tenuis et subtiliter filamentosus, statu vivo non visus, in herbario rufo-fuscus, ramiteniores et ramuli valde pallidiores; basis non visa. Rami elongati, valde tenues, glabri, ca. 0.4-0.5 mm. crassi, valde uniformes, tantum ad apices sensim capillaceo-attenuati, rarius dichotome ramosi, continui aut tantum rare simpliciter fracti. Rami secundarii elongati et capillacei. Ramuli valde crebri, glabri et nitidi, plerumque 5-10 mm. longi, sed nonnulli usque 30 mm., basi saepe constrictuli, patentes aut varie curvati flexuosive aut angulati, interdum ramuli et rami secondarii tuberculati aut nodulosi, apice saepius sorediosi. Rami non exacte teres, passim in longitudine plus minus valde humiliter rugulosi, dorso saepius farinosuli. Apothecia non visa. Soredia farinosa in soraliis parvis, albis, aut in ramis tenuioribus, ramulis, et rugulis. Cortex ca. 60 μ, intus plus minus luteus aut rubus. Medulla crebra, alba, K-, 150-160 μ. Axis solidus, 260-270 μ.

60 μ thick. Medulla dense, white, K-, 150-160 μ broad. Axis solid, 260-270 μ.

The type, from the Spanish island of Fernando Po in the Gulf of Guinea, Africa, was collected by Gustav Mann, April 1-3, 1860, at an elevation of 9000 ft.; it is in the herbarium of the New York Botanical Garden, and a fragment is in the herbarium of the author. Evidently a whole plant would be longer than this specimen, and presumably its basal portion would also be more robust. This must be a very ornamental *Usnea* in its native forest.

Other New Records

Hawaiian Islands: One of the loveliest ornaments of the northern forests is found around the world from Newfoundland to the west coast of North America, and from Japan and China to the Caucasus Mts., and all over central and northern Europe to the British Isles, but has never been reported from the Hawaiian Islands. It therefore gives me pleasure to state that a fragment of *Usnea longissima* var. *robustior* Asahina is known from Hawaii (without more specific locality data). I discovered it in a packet issued by G. K. Merrill as no. 15 of his *Lichenes Exsiccati*, labeled *Ramalina manni* Tuck. There was no *Ramalina* in the packet, only this fragment of *Usnea*. As I was not familiar with the variety, the specimen was named by Dr. Y. Asahina. It has not hitherto been known outside of Japan.

To Dr. W. C. Steere, Director of the New York Botanical Garden, and to Mrs. Mary Fleming of the Cryptogamic Herbarium, I owe the opportunity to study the following *Usneas:*

Bolivia: R. S. Williams collected in western Bolivia in 1902 and secured a number of *Usneae*. *Usnea alata* Motyka was found at Apolo, July 18. This robust species reaches a length of 2 m. and a primary stem diameter of 2.8 mm.

Usnea (Eumitria) *inanis* Motyka. Tamupasa, July 6. Motyka gave the length of this *Usnea* as about 10 cm., but incomplete specimens collected by Mr. Williams, lacking a base, are from one-half to three-fourths of a meter in length, with stems up to 1.5 mm. thick. Of course, these dimensions would probably be exceeded if entire plants had been secured. A section about a millimeter in diameter gave the following dimensions: cortex 60-75 μ; medulla 150-180 μ, roseate or only the outer part roseate, yellow with K; axis about 775 μ, with a cavity 275-400 μ in width, filled with lax hyphae; with K the hyphae dissolve, and the axis becomes yellow or finally may turn to orange. Apothecia on tips of lateral branches, up to 6 mm. in diameter; marginal fibrils few

to very few, tips pointed, longer or shorter than a disk diameter; excipulum smooth, convex; disk deeply concave, smooth, pruinose.

Usnea jamaicensis Ach. Ipurima, at 2248 ft., *Williams* 2248. Also collected at Sorata at the foot of the Illampu, at 8717 ft. The excipulum varies from smooth to markedly tuberculate. These plants, growing on trees, are intermediate between *U. jamaicensis* and *U. aspera* (Eschw.) Vain., as described by Motyka, and might with equal propriety be called by the latter name. I place them under *U. jamaicensis* partly because it is the older name, and partly because *U. aspera* is only recorded as growing on rocks. Since these specimens have well-marked characters of both species, it is evident that *Usnea aspera* is invalid, and must become a synonym of *U. jamaicensis*.

PUERTO RICO: *Usnea antillarum* (Vain) A. Zahlbr., Maricao Insular Forest, mingled with *Teloschistes flavicans* (Sw.) Norm., *L. R. Almodovar,* Sept. 1958.

URUGUAY: *Usnea densirostra* Tayl., Montevideo, *José Ernesto Gilbert,* 1858-86.

JAVA: A specimen of *Usnea olivacea* was received from my friend Dr. M. S. Doty of the University of Hawaii. He found it on *Araucaria bidwilli* in the Botanical Garden at Tjibodas at 1400 m. alt.; this provides a new locality for this East Indian *Usnea.*

Usnea squarrosa Vain. Pangrango Volcano, above Tjibodas, *James Motley,* July—Aug. 1852; this is the first record of this Philippine *Usnea* in Java.

NEW GUINEA, Central District: *Usnea misamisensis* Vain. (Motyka's publication as *U. misaminensis* is a typographical error.) Common on branches of trees, Dieni, Ononge Road, *L. J. Brass* 3991a, May 6, 1933; also very common on upper branches of trees in mossy forests in the foothills, East Mt., Tafa, 2100-2350 ft., *L. J. Brass,* May 29, 1933; this Philippine lichen has not been reported from New Guinea before. Elsewhere I have seen specimens of this *Usnea collected* on Mt. Sattelberg in former German New Guinea at about 900 m. alt.; they were collected by R. Pöch.

Usnea flexilis Stirt., another *Usnea* not reported before from New Guinea, was taken by Mr. Brass at Tafa, East Mt. The species is widely distributed in the Indo-Pacific tropics.

Usnea schadenbergiana Göpp. & Stein. Dieni, Ononge Road, 700 m., *L. J. Brass;* hitherto known only from Mindanao, Philippines.

AFRICA: *Usnea goniodes* Stirt. On the banks of the Tana River [in what is now Kenya], *W. A. Chanler,* in 1893.

REVIEWS

KEISSLER, KARL VON: "Usneaceae." Dr. L. Rabenhorst's *Kryptogamen-Flora von Deutschland, Österreich und der Schweiz.* IX. Band, 5. Abteilung, 4. Teil, Lieferung 2 (1959) [pp. 161-320, fig. 29-38], Lieferung 3 (1959) [pp. 321-480, fig. 39-44]), Lieferung 4 (1960) [pp. 481-640]. Akademische Verlagsgesellschaft Geest & Portig K.-G., Leipzig. Price: DM. 25,—per Lieferung.—The second, third, and fourth *Lieferungen* of Keissler's "Usneaceae," appearing so soon after the first (reviewed in *The Bryologist* 62: 74. 1959), assure that the publishers are serious in their attempt to complete "Die Flechten," the long neglected Volume 9 of the "Kryptogamen-Flora." The present parts concern two species of *Alectoria,* four of *Cornicularia,* 15 of *Ramalina* and 33 of *Usnea.* The specific nomenclature is unmodified but there are 25 new combinations involving taxa of infraspecific rank (to be listed in "Recent Literature on Lichens—34"). Morphological and anatomical descriptions of the genera are given, and those of *Ramalina* and *Usnea* are especially detailed.

The copious citations to the literature and to specimens and the exhaustive consideration of all variations, for which the series is so well known, reach maximum development in a 26-page treatment of *Cornicularia tenuissima.* But one can hardly complain of such beautiful attempts at perfection, rare as they are in lichenology today. In my review of the first part, I understood (incorrectly) that the "Usneaceae" would be completed in four parts. The publication of the fourth *Lieferung* now leaves still four more sections of the genus *Usnea* to be treated.—W. L. CULBERSON.

FINK, BRUCE: *The Lichen Flora of the United States.* Completed for publication by Joyce Hedrick. xii + 426 pp. 4 fig. 47 pl. University of Michigan Press. Ann Arbor. 1935; reissued 1960. Price: $12.50.—This manual was first published in 1935, nine years after Dr. Fink's death. His notes underwent much revision by Mrs. Joyce Hedrick Jones, and it was through her effort that the flora was published at all. The book has been out of print for years. and we welcome it back. It is historically important. Despite its overwhelming shortcomings that lichenologists loudly deplore, many library copies are now almost worn out.

The student unfamiliar with the book should be warned that it will be of only the most limited help in the identification of specimens. The some 1500 species included represent only about 75% of those known from the (48) United States today and the keys simply defy use. For almost every genus the taxonomy and nomenclature have by now been so modified that one has little guarantee that the name of a plant determined from the *Lichen Flora* will be even remotely close to that currently used by lichenologists.

The facsimile printing of the book is good, the excellent photographs of the original have reproduced surprisingly well, and the binding too is like the original's: it is sure to fall apart with any use at all. I will reproach the University of Michigan Press on one point only. The title page of the facsimile edition says that the book has a "new forward by Alexander H. Smith," and a large advertisement for the book in the current issue of a widely circulated biological journal offers the bait of this "new preface." In a day when so many facsimile editions of botanical works do contain genuine new forwards—sometimes so valuable as to justify pur-

chase for the forward alone—the uninspired four sentences that make up this one come dangerously close to the sort of editorial hoax that we do not like to associate with the university presses.—W. L. CULBERSON.

RECENT LITERATURE ON MOSSES

MARGARET FULFORD[1]

ABRAMOVA, A. L. Hepaticae et Musci URSS Exsiccati. Decas III. Nos. 21-30. Edidit Inst. Bot. nomine V. L. Komarovii. Acad. Sci. URSS. Leningrad. 1957.

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ANDO, H. The *Hypnum* species restricted to Japan and adjacent areas (3). Jour. Sci. Hiroshima Univ. Ser. B, Div. 2 (Bot.) 8: 167-208. Fig. 16-26. 1958. [New: *H. calcicolum* sp. n., *H. plumaeforme* var. *minus* Broth. ex Ando v. n., *H. sakuraii* (Broth. ex Sak.) ç. n., *H. sakuraii* var. *venustum* v. n.; key to species of *Hypnum*]

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RECENT LITERATURE ON LICHENS—34[1]

WILLIAM L. CULBERSON[2]

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[1] The names of new taxa from the Americas are marked with an asterisk (*).

[2] Dept. of Botany, Duke University, Durham, N. C.

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f. *arbuscula* (Mot.) n.c.; *U. comosa* f. *glaucina* (Mot.) n.c., f. *gorganensis* (Mot.) n.c., f. *tatrana* (Räs.) n.c.; *U. sorediifera* v. *glabrescens* (Nyl.) n.c. with f. *extensa* (Vain.) n.c., v. *laricina* (Vain.) n.c., v. *substerilis* (Mot.) n.c., v. *compacta* (Räs.) n.c.]

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[RIABININ, A. A. & L. G. MAMIUKHINA.][a] [Structure of triterpene alcohol—zeorine.] [Zhur. Obshchei Khim.] 27: 277-281. 2 tab. 1957. [For a detailed English summary, see Chem. Abst. 51: 12864-12865. 1957.]

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[SAVICZ, V. P.][a] [The first medical preparation from lichens.] [Vestnik Akad. Nauk SSSR] 26(7): 45-47. 1956. [On extracting usnic acid.]

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[a] Names and titles transliterated and translated respectively from the Russian.

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[ZRAZHEVSKII, A. I.][3] [Starting point of a forest soil on stony talus and methods of reforestation.] [Pochvovedenie] 1956(10): 50-57. 3 fig. 2 tab. 1956. [Lichens in soil formation.]

NEWS AND NOTES

WILFRED B. SCHOFIELD will teach a course in bryophytes and lichens this fall at the University of British Columbia.

The Sept. 30 issue of *Science* featured a handsome photograph of WILLIAM C. STEERE, recently nominated for election to the Board of Directors of AAAS.

Macvicar's *Student's Handbook of British Hepatics* is now available as a reprint from Wheldon & Wesley (Lytton Lodge, Codicote, near Hitchin, Herts., England) for 3£ 2s.

At the recent annual meeting in Stillwater, the American Bryological Society selected FRANS VERDOORN and HERMAN PERSSON as honorary members.

The following are now available from the Hattori Botanical Laboratory (3888 Obi, Nichinan-shi, Miyazaki-ken, Japan): *Hepaticae Japonicae*, ser. 11 (no. 501-550), ser. 12 (no. 551-600) and *Musci Japonici*, ser. 16 (no. 751-800)—$7.00 per series. *Journal of the Hattori Botanical Laboratory* (no. 22)—$2.70. It is better to pay by money order; if payment is made by cheque, please add $0.75.

MARIO JÄGGLI died December 27, 1959 at Lugano at the age of 79.

Since June 15, 1960, the Museum Building of The New York Botanical Garden, which houses the museum, the library, the herbaria and the paleobotanical collections, has been temporarily closed to visitors. Extensive renovations and rehabilitations of the building will include new heating, plumbing, wiring, and lighting and the installation of a new elevator. This much-needed work, undertaken on behalf of the Garden by the Dept. of Parks of the City of New York, is expected to be completed by or before the end of the year. The administrative and scientific staff have found temporary quarters in other buildings of the Garden, and a skeleton library of reference works and current publications is available.

ALBERT W. HERRE, working under a grant from the National Science Foundation since June 1959, has completed a revision of the Usneas of the United States and Canada. His paper, which treats of more than 90 species, will be published about

the end of the year by the Dudley Herbarium of Stanford University.

MÍROSLAV SERVÍT, Czech lichenologist, died April 6, 1959, at the age of 72.

MATTI AL-AISH, who has been working at Duke University with Lewis Anderson on the cytology of mosses, has accepted a teaching position at the University of Tennessee for the current academic year.

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Beginning January 1, 1939, this Exchange has been operated under the same rules as The Moss Exchange. Privileges are available only to members of the American Bryological Society who have paid annual dues of 25c to MR. HARRY WILLIAMS, Millbrook, Ont., Canada. Only fully determined specimens in packets with complete data will be accepted. It is suggested that there be at least five packets of each species with an extra which will be forwarded to the Curator of Hepatics for the American Bryological Society Hepatic Herbarium. All material for determination should be sent to the Curator of Hepatics, DR. MARGARET FULFORD, Department of Botany, University of Cincinnati, Cincinnati, Ohio.

THE MOSS EXCHANGE

As announced in THE BRYOLOGIST **38**: 100, Sept.-Oct., 1935, there is now an exchange for mosses. This exchange is available to members of the American Bryological Society upon payment of annual dues of 25c to DR. E. H. KETCHLEDGE, Dept of Forest Botany, State College of Forestry, Syracuse 10, New York. Only fully identified specimens in packets with complete data on them should be sent in. It is suggested that there be five or more packets of each species.

These two exchanges offer an excellent opportunity for A.B.S. members to build up their own herbaria of choice, well-labelled specimens.